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# SURGICAL ESSAYS

BY

**BARON D. J. LARREY,**

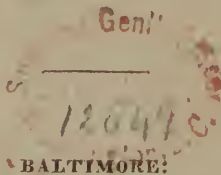
Surgeon in Chief of the Hospital of the Royal Guard;—One of the ancient Inspectors General on Service of Military Health;—First Surgeon of the Grand Army in Russia, Saxony, and France, during the years 1812 1813, 1814;—Honorary Member of the Council of Health of the Armies;—Commander of the Royal Order of the Legion of Honour;—Knight of the Imperial Order of the Iron Crown;—Member of the Institute of Egypt, of the Royal Academy of Medicine, &c.

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TRANSLATED FROM THE FRENCH,

BY JOHN REVERE, M. D.

*Member of the Royal Physical Society of Edinburgh, &c. &c.*



N. G. MAXWELL, 140 MARKET STREET.

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1823.

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1823

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**DISTRICT OF MARYLAND, TO WIT:**

BE IT REMEMBERED That on this tenth day of November, in the forty-eighth year of the Independence of the United States of America, John Revere, M. D. of the said District, hath deposited in this office the title of a book, the right whereof he claims as proprietor, in the words following, to wit:

"Surgica. Essays by Baron De J. Larrey, Surgeon in Chief of the Hospital of the Royal Guard;—One of the ancient Inspectors General on Service of Military Health;—First Surgeon of the Grand Army in Russia, Saxony, and France, during the years 1812, 1813, 1814 —Honorary Member of the Council of Health of the Armies,—Commander of the Royal Order of the Legion of Honour;—Knight of the Imperial Order of the Iron Crown;—Member of the Institute of Egypt, of the Royal Academy of Medicine, &c. Translated from the French, by John Revere, M. D. Member of the Royal Physical Society of Edinburgh &c. &c."

In conformity with the Act of the Congress of the United States, entitled, "An Act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies, during the times therein mentioned;" and also to the Act, entitled, "An Act Supplemental to the Act, entitled 'An Act for the encouragement of learning, by securing the copies of maps, charts, and books, to the authors and proprietors of such copies, during the times therein mentioned,' and extending the benefits thereof to the arts of designing, engraving, and etching, historical and other prints."

PHILIP MOORE,  
Clerk of the District of Maryland.

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JOHN D. TOY, PRINTER.

TO

J. B. DAVIDGE, M. D.

*Professor of Anatomy in the University of Maryland, &c. &c.*

SIR,

You have the peculiar happiness of being one of the founders of an institution, which, in your own time, and by the exertions of yourself and colleagues, has risen to a rank not inferior to that of any School of Medicine in our country. I know of no person to whom a work on that department of the profession which you teach, and to which your talents have been so successfully directed, can with more propriety be inscribed than yourself. It is with great pleasure, therefore, that I take this opportunity of publicly testifying my respect for your person and attainments.

J. REVERE.



## ADVERTISEMENT.

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IT will be recollected, that the author of the following work was one of the favourite surgeons of the late Emperor of France; whom he accompanied in all his military expeditions. He has given a very detailed account of the medical department of the armies engaged in these operations, in his work entitled, "Memoirs of Military Surgery and Campaigns." The three first volumes of this work, all at that time published, were translated by Professor Hall, of the University of Maryland, in 1815. Since that time, the author has published a fourth volume, containing the campaigns of Moscow and Paris, &c.; which has not yet been translated. This work is not exclusively professional, but contains also some very curious information respecting the movements of the armies, &c.

In 1821, the author published the following "Surgical Essays," which contain the results of his observations and experience on some interesting points of surgery, more generally noticed in the "Campaigns." To this collection I have added another essay, that on wounds of the bladder, extracted from the fourth volume of the Campaigns.

I have entitled this work "Surgical *Essays*," for two reasons; *first*, because the term *essay*, is nearly equivalent to the French word *memoire*; and *second*, because the "Campaigns" are generally known in this country by the title of "Memoirs," &c.

TRANSLATOR.

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## PREFACE.

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SINCE the publication of the last volume of my Campaigns, I have occupied myself, as circumstances have permitted, in confirming, by a series of researches and cases collected in the hospital the surgical direction of which is confided to my care, some maxims that I had proposed for the treatment of certain diseases but little known, and that I had merely pointed out in the fourth volume. This motive and a desire to be useful have induced me to publish the present collection. It consists of Essays or Notices, in which are contained the results of these researches, and the cases on which they are founded.

The first of these Essays has for its object the history of Moxa, and its mode of application.

This heroic remedy, which has frequently constituted the subject of my Clinical Lectures on Surgery at the Hospital of the Guard, has particularly attracted the attention of the foreign physicians who have been in the habit of attending these lectures. Notwithstanding the little confidence they at first felt in the efficacy of the remedy, they have yielded to the evidence in favour of it, and at present not only speak well of it, but have generally adopted it as the best method of treating several chronic affections reputed incurable; as diseases of the spine and hip joint, pulmonary consumptions, and schirrhus of the pylorus, &c.

The publication of three volumes of my Campaigns, in 1812, the first of which contained a plate representing the instruments used in this operation, had already excited the attention of practitioners to this remedy. Since that period, the memoir, accompanied with plates, inserted in the fourth volume of the same work, published in January, 1817, as well as the article *Moxa*, in the Dictionary of the Medical Sciences, vol. xxxiv. have extended its employment over all Europe, and I have had long since the satisfaction of learning, that many foreign physicians have obtained from it unexpected success.

It is desirable that in France there should be less repugnance in using this cautery, unquestionably less severe than that of Pott, (*the caustic potash*,) the pains of which, though less vivid, are much more intolerable, from their being so much more prolonged. The effects of the moxa are also much more favourable, as I think I have demonstrated; and, although the cautery of Pott be still preferred by many celebrated surgeons, yet I have good reasons to hope that the cases spread through these works, and the experience of those physicians who actually employ the moxa, will convince all minds, and dissipate all prejudices which still exist against the employment of this mode of cauterisation.

Since the printing of this Essay, I have collected a considerable number of facts which confirm more and more the truth of my assertions.\*

\* One of my colleagues will make known, in detail, the case of a grenadier in the horse guard, by the name of Lemaire. This young man has been under treatment in my ward for a pulmonary consumption in the third stage, in consequence of a slight wound; twenty-five to thirty moxas, and an emollient regimen, have conducted this patient to a cure so perfect, that he has regained his usual flesh.

Doctor Chardel will no doubt publish also the case of a patient affected with tic-doloureux of the face, extremely violent, and against which all the usual methods had been unsuccessfully employed. Thirty-five moxas caused this disease to disappear, and Madame de C——, the subject of this case, is now perfectly well.

I have allowed myself but little latitude in speaking of the diseases against which I have employed the moxa with success. Wishing to confine myself, as much as possible, to the strict meaning of the title of this work, I have preferred to leave to physicians themselves the task of explaining, more at length, the effects of this topical remedy which I have recommended. I will take the liberty on the present occasion to remark, that there are very few dangerous diseases which can be treated, with any certainty of success, without the assistance of surgery, which I will call, with Marcus Aurelius Severinus, and many other celebrated physicians, the *efficient medicine*.

I have presented in the second essay the result of the researches I have been long engaged in, on the seat and effects of certain diseases of the brain, as Nostalgia, as well as the causes of the different symptoms which characterise wounds in different parts of this organ. In this respect, this essay appears to me to merit some attention on the part of the reader. The cases, which constitute a part of this essay, are authentic and unquestionable; I think they may assist in throwing light on all the diseases of the encephalon, and indicate the mode of treatment the most appro-

priate in each. Some of these cases will be found particularly interesting.

The third essay, or rather *notice*, of the properties of the iris, is a development of that which I communicated in 1817, to the *Société Philomatique*.\* I believe myself to have been the first who attracted the attention of anatomists and oculists to the independent properties of this membrane. The subjects of the cases which establish the truth of this opinion, have been presented to the Medical Societies. This discovery, if it be not of very great importance, at least enables us to understand the true cause of the motions of the pupil, and the nature of the morbid aberrations which the iris may undergo, and throws light on the diagnosis of some complicated diseases of the eyes, which discourage the patient, and cause the greatest uneasiness to the physician.

I have also included in this collection some other essays already inserted in medical journals; I have thought that their re-publication in this volume would render them more accessible to young physicians.

The first treats on wounds of the belly, with lesion of the intestines. This subject is almost

\* *Bulletins de la Société Philomatique*, year 1817, page 134.

new, and merits particular attention. The reflections which accompany the facts that I have reported may be useful to practitioners, and fix their opinions on the means to be employed in analogous cases.

The second relates to fractures of the neck of the femur. This accident, too frequently, leaves those who have suffered it infirmities, more or less serious; such as anchylosis of the articulation, crookedness of the limb, with difficulty in moving it, a false articulation in the place of the fracture, with incapacity of walking safely. The apparatus for permanent extension, which many surgeons still employ, often produces chronic ulcers in different parts of the limb; other practitioners leave it entirely to itself. These two extremes are equally injurious.

The method that I have long employed is not subject to either of these inconveniences, and I may affirm that it has the double advantage of attaining both the objects above proposed without causing any accident, and of favouring the consolidation of the bone, according to the indication of nature.

The apparatus which forms the basis of this method, is simple and easy of application. It may be employed, with the necessary modifications,

for fractures of the superior, as well as the inferior extremities, whether they be simple or compound.

Such is the result of my latest researches and experiments; I shall be satisfied if this new work should contribute to the progress of surgery, and give me a stronger title to public esteem.

*Paris, 1821.*





LARREY'S

**SURGICAL ESSAYS.**

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**ESSAY I.**

---

OF THE USE OF MOXA.

**D**URING my campaigns in North America, Egypt, and Syria, having witnessed the truth of what has been asserted by travellers and authors, of the great benefits which the people of these countries derive from the use of moxa in many morbid affections, I was induced to seize upon every suitable occasion, which offered in my practice, to try this remedy.

After having reflected well upon the nature of the diseases which appeared to me to indicate its application, I attentively observed the effects of this cautery, in its mode of action, both when applied according to the method of the ancients,

and with the modifications that I have myself made. I have also examined in the dead body the traces of impressions left by this cautery, when it has been found insufficient to restore the equilibrium of the system, from the too advanced state of the disease.

The fortunate and extraordinary results, obtained from its application, in a great number of desperate cases, have induced me to develope in this essay, the article devoted to it in the *Dictionnaire des Sciences Medicales*, which is necessarily very short. I cannot but believe that this undertaking will not be found useless to the public, imbued with a fatal prejudice against this remedy, nor to those physicians who have not had an opportunity to practice in large hospitals.

It is not without good grounds, that the inhabitants of Asia and Africa have eulogized moxa, not only for its power in curing many diseases which resist other remedies, but also for its prophylactic effects. The reputation of this powerful agent would undoubtedly have continued in Europe, if, as in China and Egypt, it had been applied with proper precautions. It is by returning to the simplicity and perfection of this first mode of application, that I have succeeded in deriving from it all the advantages, which

the ancients discovered it to possess, and in removing those objections which have been justly made to it, when it has not been applied with the necessary precautions.

In the description I am about to give of this cautery, I shall endeavour to occupy the attention of the reader, in demonstrating its efficacy in all the above described cases. I shall not stop to inquire into its origin, which seems to be lost in the night of ages, nor on its various forms or modes of application among the different people who have used it. These circumstances, minutely related, may be found in the *Dictionnaire*, before mentioned, under the article *moxibustion*, by the celebrated Percy.

I will first describe the moxa, as used by myself. I shall afterwards point out its mode of application; the regions and points of the human body on which it should be placed. I shall afterwards make known the specific properties of moxa, and its general effects at the time of its application; I shall retrace, succinctly, the maladies against which I have employed the remedy with success, analyzing, as far as possible, its particular effects in each. Lastly, I shall relate some appropriate cases, which I have collected in the course of a practice of more than thirty

years; after which I think it will not be doubted, that the profession might derive great advantages from this cautery, if it were more used.

The core, or cylinder of moxa is composed of a suitable quantity of carded cotton, rolled up, and sewed in small pieces of fine linen. This cylinder should be about an inch long, and of suitable thickness; its size, however, may vary according to circumstances. An instrument for applying it, which may be called a *porte-moxa*, represented in the plate, is intended to fix the cylinder on the point, where the application is to be made. The metallic ring of the *porte-moxa*, is kept from the skin by three ebony balls, which are bad conductors of caloric. After lighting the apex of the cone, the combustion is kept up by means of a blow pipe, represented in the same plate. It is not necessary to hasten the combustion, as it ought to proceed slowly.

To apply the moxa well, we mark at first, with a little ink, the point where the application is to be made. The surrounding parts should be covered with a wet cloth, leaving the point marked alone exposed; this protects the neighbouring parts from the contact of the sparks. After applying the fire to the apex of the moxa, it is then to be fixed on the point marked out, and by means

of the *porte-moxa*, retained in its situation, while, with the blow pipe, the combustion is kept up, until the whole is consumed. To prevent deep inflammation and profuse suppuration, which would be the result, it is necessary immediately afterwards to apply on the point, the volatile alkali.

According to some authors, we may apply the moxa on any part of the body; but I think with others, that we should except, in the first place, all that portion of the cranium, which is only covered by the skin and pericranium. Here the effects of the moxa, and especially those of the actual cautery, are felt too directly by the cerebral membranes, or even the brain itself; from which dangerous accidents may result, and of which there are many examples. Dehaën relates two cases which prove the danger of its application upon this region.\*

2. We should not apply it on the eye-lids, nose, nor ears; we should also avoid its application over the course of the larynx, trachea, sternum, mammæ, linea alba, and organs of generation, except upon the perineum, towards the origin of the urethra, for scirrhus, and chronic engorgements of these parts, especially the prostate.

\* See vol. ii. of the posthumous works of Pouteau, p. 44.

3. We should also abstain from the application of every kind of cautery in the course of the superficial tendons, and those parts of the joints, where we have reason to fear interfering with the capsular ligaments.

The effects of the moxa are different from those of the metallic cautery, which appear to be limited to the point immediately touched by the fire. The part becomes disorganized, in a greater or less degree, in proportion to the volume and thickness of the cautery, and the force with which it is applied. It is accompanied with a vivid and sharp pain, that the patient supports with difficulty, and is sometimes followed by a destruction of the subcutaneous nerves, and a very copious suppuration. But the moxa, which burns slowly, is less alarming to the patient, and is more gradual. This remedy has also appeared to me to communicate to the surrounding parts, together with a relative mass of caloric, a very active and volatile principle, furnished by the cotton-like substances during combustion. The excitation and irritation, which result from the two products, increased by blowing, propagate themselves, by degrees, to the deep seated parts, so as to re-establish the action of the nerves which have become weakened or paralysed, and



to arrest the progress of the morbid cause established in certain parts. When we wish to obtain superficial effects from the moxa, we have only to suffer it to burn, without using the blow pipe. This is the method of my honourable colleague, Baron Percy.

I shall endeavour to explain the stimulating effects of the moxa, when I speak of the causes of those diseases, in which it appears to me to be indicated. During its application, I have remarked, that the first degree of heat causes to the patient rather an agreeable, than a painful sensation; this is gradually increased, until the pain becomes extremely acute. The patient, however, supports it the more courageously, as he is prepared for it, and knows, by experience, after the first application, that it is removed in an instant, by the application of the Aq. Ammon.

The number of moxas will necessarily vary, according to the duration of the disease. We may apply one or two moxas at a time; but it is necessary to leave an interval of several days between each application; because the internal effects of one or two moxas, at most, are equal to those of a great number, applied at the same instant, upon the same region. But a greater number at one time, would not be merely useless;

they would have the additional inconvenience of causing to the patient very severe pains, which he could not support, and of producing, at the same time, from the number of eschars, a very copious suppuration, which might be followed by traumatic fever and exhaustion. One or two applications at a time may, therefore, be considered quite sufficient. A humid state of the atmosphere is not so favourable to the success of the remedy, as clear and dry weather, which should be always preferred for this operation. To favour or assist the efficacious effects of this remedy, in many cases, it is proper to precede its application either by dry or wet cupping; and to follow it by the internal exhibition of suitable remedies. As cupping is a powerful auxiliary of moxa, and as there is considerable analogy between its revulsive effects, and those of the cautery, I shall take the liberty, before proceeding farther, to make a short digression on this subject.

The instrument used for this purpose, is a vessel, either of glass, or some other transparent substance, as horn, of a pyramidal or bell shape, intended to produce a vacuum on part of the surface of the body, where it may be applied. This is sometimes effected by an air pump, fitted to the cup, and at others, by a combustible sub-



stance burnt in it, at the moment preceding its application. Our object in using this topical remedy, is to produce a relative revulsion in the part affected, from the interior towards the exterior, with or without blood-letting, according to circumstances. I conceive that, to fulfil this indication, as fully as possible, the vacuum should be produced by means of a combustible substance, which has the effect of rarefying, or diminishing the air contained in the cup, and producing, at the same time, a relative mass of caloric, which may apply itself to the skin and penetrate its tissue, without, however, burning the part. Thus, the organic, capillary vessels of this covering, after being swelled by the expansion of the æriform fluids that they contain, being no longer compressed by the external air which has been removed from, or considerably rarefied, in the cup, become slightly inflamed by the contact of the caloric evolved during the combustion, employed for this purpose, which causes an artificial erysipelas. The most simple, prompt, and least painful process, for obtaining these results, is to use a common cupping glass, in which a little fine tow has been burnt, in the bottom of the vessel. We may increase the quantity of caloric, and the action of the cupping glass, by pouring upon the

tow a few drops of alcohol, this is particularly necessary in dry cupping.

Cupping with the air pump does not possess the same advantages; for, besides the inconvenience arising from its weight, and that of having a large number of cups, of different sizes, fitted with brass tubes, so that the cylinder of the pump may be adapted to them, it has also the objection of removing, with the air, the heat of the part, and of producing there a relative degree of cold; in fact, the temperature is sensibly diminished. We obtain thus, but a simple swelling of that portion of the cutis included within the cupping glass, with but little redness, so that the derivation is nearly nothing. We are sometimes compelled to scarify, more or less deeply, to obtain a sufficient quantity of blood; this kind of solution of continuity is not without its inconveniences. Sometimes filaments of the subcutaneous nerves are wounded, from which nervous symptoms result; sometimes small branches of arteries are divided, which produce hemorrhages difficult to stop, of which I have seen instances; these inconveniences are always attached to instruments which we have not completely under the command of the will. But the scarificator that I

use, which was invented by myself,\* makes the scarifications as superficial, or as deep as we wish. These scarifications embrace all the surface included within the cup, and are made with almost as much promptitude as those with the English or German scarificator, with this difference: those made by my scarificator are less painful and more uniform.—In a word, experience has proved to me, that this mode of cupping is the best, and most convenient. It contributes much, with the moxas, towards the cure of those patients for whom this last remedy is indicated. It is especially convenient in every kind of phlegmasia, and there can be no comparison made between it and leeches.

I will now retrace succinctly, and with as much method as possible, the diseases where the moxa is indicated; and I will make known the modifications, that one ought to observe in its mode of application, in each. I shall begin with the diseases of the organs of sensation, and successively describe those where this cautery may be employed with advantage.

\* A kind of fleam.

*In Affections of Vision.*

The imperfect action of the membranes composing the globe of the eye, incipient cataract, and recent weakness or paralysis of the optic nerves, truly indicate the application of moxa. It should be made in the course of the nerves most intimately connected with those of the eye, such as the trunk and principal branches of the facial, those of the superior maxillary, and of the frontal. The excitation imparted to these nervous branches, propagates itself, successively, and extends, at last, to those affected with disease; the morbid condition of which is gradually dissipated, and the vital properties of the diseased organs restored in the same proportion. To the exciting property of the moxa, which is the most efficacious, may be added, if we wish, the revulsive and derivative property produced by the suppuration of the cauterized part, when we suffer this to take place. It is easy to distinguish the cases where it is necessary, from those in which it is useless, or even injurious. By this remedy, I have particularly stopped the progress of *amaurosis*, and have caused it to disappear, in some instances, where the blindness was complete; several

instances of this may be found in the history of my campaigns; but that of the little English boy, related in the third volume of those memoirs, being the most remarkable, I will give a summary of it.

This blindness, according to the statement given to me by the father of the child, had seized him suddenly in the Asturias, in Spain, during the severe cold of winter, to which he was exposed. This cold had, necessarily, produced upon him effects the more injurious, as his hair had been cut very short, and he had travelled bare-foot from Corunna to Valladolid. There was no doubt, in this case, of the existence of amaurosis; the motion of the iris, however, remained. It would be difficult to give an adequate description of the father of this child, a corporal in the English army, and his deep affliction at the unfortunate condition of his son. As the blindness was recent, I conceived the hope of curing this little patient, otherwise very interesting.

After placing him with his father, in the best ward of the hospital, and having ordered him to be washed carefully in soap-suds, I directed the exhibition of some diaphoretic bitters, and applied the moxa over the course of the facial nerve, behind the angle of the jaw. The head was well

rubbed with camphorated liniment, and, immediately afterwards, carefully covered up with a woollen night cap. At the second application of the moxa, the child saw the light; at the fourth, he distinguished objects and colours; after the seventh, the function of vision was completely restored.

When, with the paralytic affection of the parts of the eye, which we have pointed out, there are joined symptoms of plethora in the vessels of the parts diseased, it is necessary to precede the application of the moxa, by scarifying and cutting the temples, nape of the neck, or shoulders, and to take blood, if necessary, from the jugular vein, or temporal artery. Leeches, without possessing the advantages of cupping, are inconvenient, and, especially, when applied near the eye, produce ecchymosis, which increases the atony and engorgement of the conjunctiva. The number of moxas must be in proportion to the duration and severity of the disease. We may assist the effects of this remedy by aromatic fumigations, revulsives, dry or humid, directed upon the eyes, light alcoholic, camphorated embrocations upon the eye-lids, by the internal use of calomel, alone or combined with other substances, according to circumstances, and by electric sparks directed

upon the upper eye-lid, where the moxa cannot be applied, if it be paralysed.

*In affections of the sense of Smell.*

I have obtained no success from the application of moxa, with those persons who have lost the sense of smell. It appears that the particular modifications that the olfactory nerves undergo, in the pituitary membrane, for receiving the impression of odours, render the nervous tissue of this membrane inaccessible to the exciting and electric effects of moxa. I think, therefore, that the remedy is useless in this affection.

*In affections of Taste.*

The same remarks will apply to the sense of taste; I have learnt from experience, that moxa has no effect upon this sense.

*In diseases of Hearing, Voice, and Speech.*

When deafness is the result of the impression of a sedative, stupifying cause, as cold, applied suddenly to the ear, or the influence of a current of humid air directed upon this part, the moxa, if applied over the course of the branches of the facial



nerve, and about the auditory opening, restores the function of hearing. The calorific excitation of this cautery communicates the more readily with the auditory nerve, as it has intimate anastomoses with the small sympathetic; this remedy cannot be supplied by a vesicatory. I might relate a great number of cures of deafness, in the above described cases, from the employment of moxa; I shall, however, confine myself to the concise exposition of a few.

A young trumpeter of the *ex-horse* guard, after having imprudently bathed in the Seine, while in a profuse perspiration, was suddenly deprived of his voice, and the power of hearing even the loudest sounds. The nature of these infirmities were, at first, mistaken, and were treated as if feigned. The patient, however, was carried to the Hospital of Gros-Caillou, and placed under my care. After having applied cupping with scarification, to the nape, and sides of the neck, and between the shoulders, I applied a series of moxas over the course of the principal branches of the nerves above indicated. At the third application, the young patient began to hear acute sounds, and to articulate some words; at the seventh and ninth, the articulation was nearly restored, and the hearing perfect; after the



thirteenth application, the trumpeter was sent back to his regiment perfectly cured.

I have obtained the same success with other young subjects, the cases of which are related in my campaigns, in whom loss of voice and hearing had been produced by causes analogous to those which had acted upon the trumpeter.

*In Spasmodic affections of the Muscular System.*

I shall now proceed to relate the effects of moxa in paralytic affections of the locomotive system, with, or without neuralgia. I begin with the first lesion.

When convulsive and habitual motions of certain muscles (which characterise *tic douloureux*) have become chronic, whatever may be the cause; or are the result of a mechanical cause, which weakens the tissue of the nerves of the muscles, the moxa is perfectly indicated; but it should be applied as near as possible to the seat of the disease, and upon the course of the injured nerves. The lesion consists in the chronic engorgement and inflammation of the membrane which invests the nerves of the part affected, (*nevrileme*.) This remedy, by producing an excitation upon these organs, causes a salutary derivation of the morbid

principle, and re-establishes the course of the nervous fluid.

It is not equally indicated in acute neuralgia, proceeding from spontaneous causes, nor in tetanic affections, because it augments the irritation and tetanus. I have employed it, without effect, in this last disease. I will now relate some cases which, incontrovertibly, shew the success of moxa in chronic *tic douloureux*, a disease considered by almost all physicians as incurable.

A young soldier of the *ex-imperial* guard, attacked with a *tic douloureux* of the left side of the face, was sent to the military hospital of Gros-Caillou, in 1811, six months after receiving a blow with a foil on that side of his face, on the *os malæ*, and over the course of the sub-orbital nerve. This disease had resisted the application of leeches, alkaline liniments, and vesicatories, which had been placed on the temple, and behind the ear of the same side. Six moxas applied over the course of the sub-orbital, and corresponding branches of the facial nerve, entirely removed the involuntary and convulsive contractions, which the patient had almost continually experienced in the region affected.

Madame D\*\*\* was afflicted for many years with a *tic douloureux*, which began before the

right ear, and extended itself in diverging rays, following the direction of the branches of the temporal nerve, towards the upper part of the forehead, and to the eye-lids of the corresponding eye. The paroxysms were periodical, but very violent. They were followed by head-ache, violent palpitations of the heart, oppression, nervous spasms, and extreme coldness in the extremities. The convulsive contractions of the muscles of the eye-lids, caused the eye to be closed up, and entirely deprived the patient of sight, during the paroxysm. She had vainly tried, in the country and in Paris, a great number of remedies, more or less extolled.

Having seen this lady in one of the paroxysms, I examined attentively the parts affected, and made myself acquainted with every thing which could throw light on the causes and progress of the disease. The principal temporal branches of the facial nerve, could be traced by a practiced finger, resembling in form and hardness, small violin cords. The slightest pressure made upon these cords, caused a very acute pain to the patient. This neuralgia was complicated with the lesion of the greater part of the organs of internal life; I, at first, devoted my attention to the indications which these different alterations de-

manded, and when I thought I had insulated the principal disease, I applied the moxa. Three small cylinders were successively applied over the course of the trunk, and principal branches, of the facial nerve, and six Chinese moxas over the branches, or cords, which we have above pointed out. Each application was followed by a sensible amelioration, and all the nervous symptoms had entirely disappeared before the ninth. This lady has returned, perfectly cured, to her usual residence, in one of the departments of the North, where she enjoys perfect health.

A second patient, at a more advanced age, Madame de B\*\*\*, had been affected for many years with a *tic douloureux* of the left side of the face, with an incipient hemiplegia of the same side, the symptoms of which were, more particularly manifest during the paroxysm of the neuralgia. A great number of remedies had been unsuccessfully tried.

In this lady, as in the instance above related, I preceded the moxa by cupping with scarifications, and other means indicated. She also underwent a suitable treatment for removing the morbid cause of the neuralgia, without which the cure could not have been perfected, and which was continued for a long time after the moxas, the

number of which, great and small, was eleven. To my great and agreeable surprise, this lady now enjoys perfect health. This was one of the severest cases I have ever seen.

### *In Paralysis.*

Paralysis, properly so called, varies much, both in degree and extent; it is sometimes limited to an atony of the locomotive powers, without a loss of animal sensibility; in some very rare instances, this last faculty is entirely lost, while the contractility of the muscles remains perfect; or these two properties are both affected, at the same time, which constitutes complete paralysis. We often find, also, that paralytic affections of the muscles are accompanied with an increase in the animal sensibility, and these are characterized by pain, with unnatural, and involuntary motions in the affected member.

In the first instances, the morbid principle has appeared to me to carry its effects to the substance of those portions of the encephalon from which the nerves of locomotion, or of animal sensibility, arise, or to their own texture. The nervous substance, once attacked by this morbid principle, after having undergone changes propor-

tioned to the duration of the disease, finishes by falling into a state of atrophy, losing its vital properties. In the dissections that I have made of persons who had been long affected with paralysis, I have found the nerves of the paralyzed side much smaller than those of the sound members, and destitute of any shining appearance, with the characters of atrophy.

The last affection, having some affinity with *tic douloureux*, I shall commence by shewing the success I have obtained with moxa in it. I may here remark, that the alteration in the nervous substance, is combined with a kind of phlegmasia, which attacks the sheath of the nerves, or the cerebral or spinal membranes, which produces, together with a loss of power in the motions, a comparative neuralgia. Nor in this case is the moxa a less efficacious remedy; it acts in two ways, by producing an excitement in the debilitated tissue of the medulla of the nerves affected, adapted to restore the nervous fluid; and, by the suppuration of the eschars of the moxa, which causes a revulsion of the phlegmasia. This suppuration is not necessary in a simple paralysis, without neuralgia. But in the first instance, (where there is neuralgia) it is necessary to allow suppuration to take place in the eschars of the moxa, and, for the most

part, it is indispensable to precede its application by cupping, with scarifications, made in my method, over the course of the diseased part.

Mr. P \* \* \*, an advocate of Paris, had been afflicted for three years by a gradual wasting of his strength from a paraplegia, with neuralgia, marked by an inability of standing or walking, violent pains, nearly constant, trembling of the lower extremities, emaciation, insomnia, and extreme irascibility. All the usual methods in such cases had been tried in vain. The *nux vomica*, which had been prescribed, only aggravated the neuralgia, without increasing, at all, the tonic power of the muscles.\*

After having applied several series of cuppings, at suitable distances, over the lumbar region, and in the course of the principal nerves of the lower extremities, I began the application of moxa, two at a time, beginning from that part of the vertebral column where the disease appeared to begin. This was about the tenth or eleventh dorsal vertebra, the spinous processes of which made an

\* The trials which I have made of this remedy, in some paralytics, have produced similar results. There can be no doubt that, so far from dissipating the phlegmasia of the nervous membranes, it augments it. I have remarked that its effects are constantly pernicious, and I think, contrary to the opinion of some physicians, who extol this remedy, that it should be proscribed in the practice of medicine.



unnatural projection at that point, and the part was very painful to the touch.

The first applications calmed the pains, and encouraged the patient. The two next were immediately followed by spontaneous motions in the diseased limbs, and a delightful calm, that, for the first time, for a great while, permitted the patient to sleep sound, and from which he did not awake for eight hours. After the eighth moxa, he could stand upright, and walk a few steps by means of crutches. The pains and tremors of the extremities had entirely disappeared by the tenth application, and the contractility of the muscles was sensibly increased. After this, every application sensibly augmented the force and action of all the vital properties in the limbs, so that their nutrition was equally re-established. This amelioration has been gradually increasing, under the influence of the moxas, which I have applied, two at a time, at suitable periods, but never with a less interval than five days. I have allowed them to suppurate a little, for the reasons given above. After the twenty-sixth moxa, the patient could walk, and went to the theatre on foot, with one support. After the thirty second, I conceived that the cure had become as perfect as possible. It is remarkable, that Mr. P \* \* \* could walk for



a long time with the assistance of a cane, without pain, or inconvenience. The pains in the extremities were no longer felt, and the limbs recovered, by degrees, their primitive form and size.

This paraplegia presented one remarkable phenomenon, which I have never seen, so strikingly, displayed in any other paralytic, that I have treated in the same manner. Every application of the moxa produced contractions as strong in the feet and legs, as those which result from galvanism directed upon the denuded nerves of recently amputated limbs.\*

At my return from Belgium, in 1815, I found at the military hospital of Gros-Caillou, two soldiers of the imperial guard, affected by paralysis, with neuralgia of the fore arm and hand, in consequence of gun-shot wounds of the arm. In one, the projectile had traversed the limb in its inferior third, and passed behind the humerus; in the other, the ball had passed through the middle part of the arm, before the bone. In both of these cases, the paralysis was confined to the muscular action, while the animal sensibility was increased. One of them, especially, experienced the most violent pains in the hand and fingers, with a

\* See the bulletin de la Société Philomatique, May and June, 1793, vol. 1.

disagreeable sense of formication, at their extremities. Emollients and narcotics, particularly opium, had been employed without success. The paralysis and pains had, however, continued to increase, and amputation was looked forward to, as the only means of removing these torments. I encouraged them as much as possible, and devoted my personal attention to them.

After causing the limbs to be washed in strong soap suds, I applied the moxa above the cicatrices, and over the course of the injured nerves, proceeding from above, downwards. The pains and formication disappeared rapidly, and the power of motion gradually returned in the muscles of the fore-arm and hand. One of these soldiers left the hospital perfectly cured, a few months afterwards; the other, who was sent to Val-de-Grace, to be cured of a psoric eruption, which had taken place during his treatment for the wound, fell under the care of one of my old pupils, M. Desruelles, who continued the moxa with the same success.

Hemiplegia of the face has been considered by authors, until now, as incurable, because no one has dared to apply the moxa to this part. Indeed, when applied in the usual way, it produces deep and extensive ulcerations, and other accidents, which may prove more troublesome than

the disease itself. It is this which has induced authors to forbid the application of this caustic on the face; but the modifications that I have made, have enabled me to apply the moxa upon the face, as upon other parts of the body, only I have taken the precaution to make the cylinders of cotton much smaller, and to prevent suppuration of the eschars, by the application of the ammonia.

The first subjects attacked by this disorder, who were cured by this method, were young soldiers of the imperial guard, who, in consequence of sleeping upon the wet ground, in the open air, during the first campaign in Prussia and Poland, had one side of the face paralyzed. The eye of the affected side remained open during sleep, the angle of the mouth of the opposite side was retracted, in consequence of the contraction of the sound muscles, &c.

The repeated application of small moxas, over the course of the branches of the facial nerve, and some of the anterior branches of the cervical pairs, restored, in these patients, the paralyzed muscles. The cases of these young soldiers are recorded in the registers of the hospital of the guard; I shall therefore dispense with stating them here, and confine myself to that of a young lady that I had occasion to treat, in private

practice, with the same success. The disease presented the same characters, but arose from a different cause.

Miss de M\*\*\*, since Madame D\*\*\*, about seventeen years of age, of a nervous constitution, and very delicate, uniting with the graces of a fine mind, other qualities the most rare, had been afflicted, from her infancy, with a hemiplegia of the left side of the face, supervening on a verminous fever. Electricity, and *douches*\* of mineral water, had been unsuccessfully used. The deformity was extreme, and gave to the countenance of this young lady, otherwise very beautiful, a disagreeable character, especially upon the least smile. A desire to be relieved from this shocking deformity, induced her to have recourse to the moxa, which I proposed, as the only efficacious remedy, contrary to the opinion of several physicians. I had a small porte-moxa, made for the purpose, and I applied the first cones over the course of the trunk of the facial nerve, where it passes out from the stylo-mastoid foramen. From this point, I followed, in three diverging lines, the direction of the principal branches of this nerve, making the applications at suitable distances. They

\* A continued column of water applied to a part. A remedy much used in France.

were certainly painful, but the young patient, who possessed great fortitude, supported the application without uttering a cry. The prompt and immediate application of the volatile alkali, removed, in an instant, the pain. The eschars of the moxa dried, and fell off, in small black scales, by the tenth, or thirteenth day, leaving a very small, red, cicatrix, that time and saponaceous lotions entirely removed.

At the fourth application, there was a sensible change in the disease; the improvement, however, was but slow, until the ninth application. Afterwards, the progress was more rapid, and after the seventeenth, the cure had arrived at the highest degree of perfection, which the case admitted. Both the angles of the mouth were parallel; the pronunciation, which, before this treatment, was very difficult, now became perfect. The paralyzed eye could not be entirely closed, but, with this slight deformity, the muscular functions of the face were almost entirely restored.

Hemiplegia of the extremities, when it has become chronic, is much more obstinate. When not recent, it is difficult to obtain a cure, because the portions of the brain, and spinal marrow, from which the disease is derived, are too remote from the operations of art, especially if the

patient be fat. When the paralysis is recent, and the subjects are thin, we may obtain a complete cure. I have treated a great number of soldiers, affected with hemiplegia, from the excessive cold they suffered during the campaign of Russia. The moxa, applied on the sides of the vertebral column, and upon the course of the principal nerves of the limbs, produced astonishing effects; it is true, however, that the cure proceeded slowly.

In my relation of the campaign of Egypt, I have remarked, that moxa restored the moving powers of the muscles of the superior extremities, paralyzed by wounds, however superficial, complicated with lesion of the branches of the cervicæal pairs of nerves. I have observed, also, that in relapses of these paralysses, it becomes necessary to re-apply the moxas above the cicatrices, and over the course of the injured nerves. We should insist upon the application of this remedy, as long as the disease remains, whatever may be its character.

I will now relate the case of a young soldier, in whom I observed a loss of animal sensibility only. The right shoulder, all the external surface of the arm, the fore-arm, and the hand, had entirely lost their sensibility in this young man. The skin of this part might be pricked, or burnt, or pinched, without the patient feeling the least



pain; at the same time, the motions were not suspended for a single moment, and could be executed with as much force, and precision, as those of the left arm.

This soldier had received a stab from a sabre, above the clavicle, in the middle of the triangular space formed by the union of the humeral extremity of this bone, and the acromion process. The wound was very superficial, indeed it could hardly be distinguished. There is reason to believe, that the instrument had only touched a few branches of the cervicals, which are destined to form the cutaneous nerves, the organs of animal sensibility, while those which supply the muscles are deeper, and, indeed, have a separate origin from the spinal marrow.

Some hypotheses, drawn from these anatomical facts, form the object of a notice inserted in the collection of bulletins of the *Société Médicale d'Emulation*,\* to which we refer those who may feel any curiosity on the subject.

Several cuppings, with scarification, applied upon this small wound, already cicatrised, and three moxas, were sufficient to restore the sensibility of the whole limb, and place it in the same situation as the rest of the body. This soldier was

\* Vol. v. year 1810.

discharged from the hospital, a few weeks afterwards, perfectly cured.

A simple muscular paralysis of the inferior extremities may be the result of an injury of the spinal marrow, or of a relative compression of this medullary process, or of the *cauda equina*. This compression may arise from the asthenic engorgement of the spinal membranes, or the effusion of a serous, or sanguineous fluid into the vertebral canal. In this case, there is no inflammation in the membranes, as is observed, when the paraplegia is complicated with neuralgia; in this case the moxas alone are indicated, and suppuration should not be allowed to take place. The application of this topical excitant and revulsive should be made along the sides, and near the spinous processes of the vertebræ; descending from the highest point, where the disease commences, and extending it to the lateral regions, of the *os sacrum*. They may also be applied along the course of the sciatic nerves. These paraplegiæ are treated with great success when they are not of long standing, and are not complicated with incontinence of urine, a very troublesome symptom. I have obtained complete success, in a great number of these cases, from the moxa; but I shall content myself with the following summary.



The Viscount, Lieut. Gen. M——, was seized with a paralysis of the inferior extremities, in the second degree, with an unnatural projection of the spinous processes of the last dorsal vertebræ, deep seated pains in this region, and retention of urine. All the organic and sensitive functions were in such an asthenic state, that they were performed but extremely imperfectly. Various topical irritants, or rubifaciants, had been applied to the limbs, unsuccessfully. I hastened to employ cupping, with scarification, preparatory to the application of the moxa. An elastic gum catheter was allowed to remain in the bladder, light drastic purges, repeated according to the state of the patient, overcame the retention of urine, and the obstinate constipation, from which the patient had long suffered.—The two first applications of the moxa induced a sensible improvement, which encouraged the general. At the third, he began to walk with the assistance of a cane; at the fifth, he could walk without assistance; and, at the ninth, he found himself perfectly well. This cure is remarkable in many points of view.

*In Organic Diseases.*

I will now run hastily over those organic diseases, for which I have also employed the moxa with great advantage; and I shall endeavor to explain its success in each of them.

In all chronic affections of the head, I have employed this remedy with great success. In idiopathic epilepsy, hydrocephalus, chronic cephalalgia, &c. &c. the applications ought to be made at the base of the cranium, and especially about the points of union of the squamous sutures of the temporal bones with the lambdoidal suture. These points answer in the fœtus, or very young infants, to the lateral, or posterior fontanelles. It is useless to rise above the line which separates the base of the cranium from what is called the skull cap; besides, there may result from it, as we have already remarked, very serious accidents. This superior hemisphere, being covered only by thin teguments and aponeuroses, the caloric passes through them rapidly, and arrives immediately at the membranes, which it predisposes to inflammation, without having any effect upon the diseased portions of the brain, which are so deep seated, that the caloric cannot approach them.

Indeed, when we recollect that the hemispheres of the brain are five or six inches thick, and of a pulpy consistence, we shall be convinced, that the cautery, when applied on the summit of this mass, cannot have any effect upon the diseased part, which is usually towards the base of the diseased organ. Finally, experience has demonstrated the truth of this assertion. I will now describe some cases of remarkable cures, obtained by the aid of the moxa, applied to the part I have pointed out.

A young trumpeter of the *ex-guard*, having received a blow upon his head, in a fall from his horse, suffered for two years epileptic fits, frequently twice in a day. The cranium was very much disfigured, and had acquired in a short time such an increase of size, that his uniform hat, which he received on entering the regiment, had become too small, by five or six lines. The eyes were very prominent, and almost immoveable, the countenance discoloured, the pulse slow, the respiration laborious, the pulsations of the heart very distant, and nearly imperceptible, and the extremities almost always cold; standing and walking were performed with difficulty, and all the sensitive functions, especially vision, and the mental faculties, were very imperfect; in a word, every thing clearly indicated a constrained and com-

pressed state of the brain, the effects of which increased according to the variations of the atmosphere, or other determinate causes. After a free bleeding from the jugular, repeated cupping from the nape of the neck and temples, ice upon the head, mustard baths to the legs, and the internal exhibition of calomel, we applied fifteen moxas about the head, especially over the parts where the lateral and posterior fontanelles formerly existed. The symptoms became gradually assuaged, at first slowly, afterwards more rapidly, so as to render the paroxysms milder, and more rare; and at last disappeared entirely; by the end of the tenth month, the patient found himself perfectly cured. All the animal and sensitive functions were soon restored, and, what is very remarkable, the arch of the cranium, was reduced through its whole circumference. The primitive conformation of these bones was restored gradually, and when this trumpeter left the hospital, his hat, which was before too small, had become too large by five or six lines; so that, in the whole circumference of the head, there had been a reduction of eight or ten lines, which had taken place under the influence of the moxa; a change such as we sometimes observe in the thorax, after the operation of

empyema \* The effect of the topical revulsive remedies applied about the head, and towards the base of the cranium, was powerfully seconded, in my opinion, by the internal use of camphor and calomel combined, in large doses; sometimes by the extract of bark, with opium, and at others, by the nitrate of potash, and the extract of valerian. The patient used, besides, a decoction of barley, as prepared by the brewers, sweetened and acidulated with muriatic alcohol.

This patient was examined during the treatment, and after his cure, by a large number, both of French and foreign physicians, who attended my Lectures on Clinical Surgery. Doctor Boisseau, one of the most distinguished of my old pupils, was charged with the particular care of this patient.

A grenadier of the infantry of the guard, was carried to the military hospital of Gros-Cail-  
lou, in the latter part of the year 1817, having all the symptoms of *hydrocephalus internus*; such as great weakness in the functions of the organs of locomotion, especially in the inferior extremities.

\* See the 3d volume of my Campaigns, p. 479.

This was likewise the case in all the organs of sense; the vision, particularly, being almost lost, and the voice interrupted and weak. The patient had frequent vertigos, and a dull, steady pain in the head, towards the occiput, with a constant tendency to sleep, or rather stupor. The pulse was slow, and (*caudal*,) forty five or forty-six pulsations in a minute. Besides the pains we have above mentioned, the patient complained of a disagreeable sense of weight over the whole head, so that he could not suffer it to fall either backward or forward, without being threatened with syncope, which the least neglect in holding it straight, instantly produced; when an ice-like coldness seized upon the extremities, and the functions of circulation and respiration appeared, at the same time, suspended. I have had frequent occasion to observe these phenomena in this patient. The mental faculties of this grenadier did not appear to me at all to participate in this lesion of the brain; he related, with precision, that his complaint had arisen in consequence of plunging, head foremost, into the Seine, from a very elevated place, and from that time he had not ceased to suffer.

After having unloaded the cerebral vessels by bleeding from the jugular vein and temporal artery, and cupping with scarification at the nape



of the neck, I applied, for several days, ice upon the head, and at length had recourse to the application of moxas to the posterior and lateral regions of the head. We suffered several of the eschars to suppurate, carrying the number to ten. To these means were added mercurial frictions to the soles of the feet, made every four or five days. After four months of this treatment, the grenadier left the hospital in very good health, and has returned to his duty, all his functions having recovered their equilibrium.

I have obtained the same success, by the same means, in an English lady, Madam J\*\*\*\*, in whom an acute dropsy of the right ventricle occurred suddenly, so as to produce apoplexy and hemiplegia of the left side, carried to the second degree. By direct bleedings, ice, and some vesicatories applied upon the head, I hoped to have accomplished the cure of this lady; it was not effected, however, until after fifteen months, by means of moxa, placed about the bones of the cranium, between the occipital processes, and on the sides of the vertebral column. The celebrated John Bell, and Doctor Morgen, assisted me by their advice in the treatment of this interesting patient, the mother of a numerous family.

A child, between seven and eight years of age, son of a retired officer, M. Walter, and of an English lady, exhibited all the symptoms of a chronic dropsy of the ventricles of the brain, with enlargement of the cranium. He was in an alarming situation, when I was desired by his father to take him under my care. The first indications being fulfilled, I applied upon the nape of the neck, and on the sides of the head, several moxas, and afterwards the actual cautery twice over the posterior and lateral fontanelles. This little patient was cured before the end of the ninth month, at which period the cranium, which had been measured before the treatment, was reduced in circumference about six lines. The child, at present, enjoys perfect health. It is proper to remark, that the sister of this child died of a similar disease, as was proved by dissection. My brother in law, Doctor Coutanceau, attended this little patient during a short absence.

Since that time, another child of the same age, of a scrophulous constitution, belonging to M. B. a merchant, at Havre, and affected by the same disease, characterized by the same symptoms, has been cured by the same means. There was also, in this little patient, a reduction of between three



and four lines in the cranium. Doctors Ribes and Spursheim were called in consultation in this case.

I have removed entirely, by the moxa applied upon the sides of the head and occiput, chronic and rheumatic head-aches, which had resisted a great number of remedies.

I think this caustic is *contra*-indicated in mental diseases, attended with excitement, however it may be extolled by some authors. If it were not for being led away from my subject, I would explain myself further on this point. But, for the present, I shall confine myself to remarking, that in such cases, it should rarely be employed.

### *In Diseases of the Chest.*

*Of Asthma.*—I have employed moxa with great success against asthma, when it was not hereditary, or produced by a bad conformation of the thorax, and the subject not too far advanced in life. I will admit also, that the disease, as I have seen it, has for its essential character, an asthenic state of the pulmonary organs, and a spasmodic and convulsive contraction of the pectoral muscles, resulting from a latent engorgement, or inflammation of the organic vessels of the muscles and membranes, which surround the chest; a

species of rheumatic affection, arising generally from a suppression of cutaneous transpiration, or other habitual discharge. In this situation, if the malady has resisted the common remedies indicated to restore the suppressed function, and remove the effects of this suppression in the part affected, the greatest benefit may be derived from the moxa, which it is, nevertheless, necessary to precede by one or more cuppings with scarification. This last has for its principal effect, to unload the organic capillary vessels of the skin, and subjacent muscles, and to produce, in the parts weakened, some degree of excitement, which the moxa gradually increases.

We ought to place cylinders of moxa in two parallel lines on the sides of the chest, towards the anterior attachments of the great pectoral, and the great dental muscles. The number should be proportioned to the severity of the disease.

I might now relate numerous cases, in point, of my success; I shall, however, content myself with a summary of that of a young woman of Paris, who, for many years, and after each menstrual discharge, (which was, however, regular) was tormented with paroxysms of asthma, accompanied with spasms, convulsive motions, and suffocation,

which were so violent, that the situation of the patient had been often very alarming.

I began the treatment by cupping with scarification, the whole anterior region of the chest; to these local bleedings, which I repeated several times, I afterwards added the moxa, which I placed on the principal points of the circumference of the thorax. The first applications reduced and retarded the paroxysms, so that the patient considered herself cured, and wished to do no more; but she was suddenly seized with another very violent paroxysm, that I allayed by the means above mentioned, that is, cupping and moxa. I insisted especially upon the employment of the last; the number of cylinders burnt upon both sides of the chest, was carried to twelve. The paroxysms disappeared entirely, and after seven or eight months of care, this young lady found herself perfectly well. I have seen her some years since this treatment, she enjoyed perfect health, not having had the slightest return of her complaint.

Intermittent, nervous palpitations of the heart, arising from weakness of this organ, and of the spinal marrow, are successfully combatted by moxa, if applied on the sides of the vertebral column, and about the region occupied by the

heart. I have cured several persons attacked by these *neuroses*, by employing this cautery.\*

The moxa is equally indicated in old catarrhal affections, and chronic inflammations of the pleura, especially when the disease does not arise from a repelled blennoragia, or tetter, which is very common, or the presence of the syphilitic virus. In either of these cases, it is first necessary to bring back the repelled discharge, and to remove the poison by suitable means. I might relate numerous cases in support of these precepts, but I shall pass at once to another disease, much more serious, which has constituted a principal object of my researches, and meditations.

### *In Consumption.*

I might devote an entire memoir to the special object of showing the efficacy of moxa, in phthisis pulmonalis, but I shall allow myself but a short digression respecting this terrible malady, acknowledged by all authors and practitioners as incurable, and mortal.

No one who had witnessed the extraordinary success I have obtained from this remedy, in

\* These *neuroses* should not be confounded with organic lesions of the heart, such as active or passive aneurism of this organ; for the curative means are very different.

rachialgia and femoro-coxalgia,\* (which may, perhaps, with propriety, be termed *rachidial*, and *articular phthisis*,) could avoid being predisposed to think well of its application in pulmonary consumption, which only differs from them in its seat. Indeed, these diseases present the same phenomena, arise from the same causes, and produce the same effects; it also frequently happens, that the disease of the spine accompanies phthisis pulmonalis.

In this last disease, as in rachialgia, the moxa produces a resolution of the lymphatic engorgements, or scrophulous tubercles, and of symptomatic abscesses, or abscesses by congestion, when they are not too far developed. It produces a detergent effect upon internal ulcers, it stops caries of the bones, produces adhesion and cicatrization of the walls of abscesses, and purulent cavities, established in the substance of the lungs, or any other part, become the seat of phthisis. In a word, the patient is conducted to a cure complete, in proportion, as we insist, as long as may be necessary, upon the employment of this topical, excitant and revulsive agent, but little used certainly, but which experience will shew to be the most efficacious against these diseases. The inter-

\* Diseases of the spine, and hip joint.

nal remedies, more or less extolled by authors, as the acetate of lead, and particularly the prussic acid, are for the most part injurious, at least useless. If, however, there be any reason to suspect a particular virus, it will be first necessary to destroy this cause, and when the disease shall have become isolated, to attack it by the moxa.

We should select, in its application, those parts of the chest which are nearest to the diseased portion of the lungs. There can be no doubt, that the hollow cylinder of wood, used by Laennec, would be favourable to this research; but the experienced physician has no need of it. Percussion, pressure made with care, and habit, and the impression exerted by the fingers between the ribs, will enable us to assign, with great certainty, the seat of the disease.

To prove the truth of my assertions, in such a manner as to leave no doubt, I am now about to report a summary of some cases of phthisis, that I have cured by the moxa.

One of my first patients was a young lady, about nineteen years of age, Rosina V——, tall, with light, fair hair, and a flattened chest; there was an incipient curvature of the spine, with an unnatural projection of several of the spinous processes of the dorsal vertebræ. She had permanent pains



in this region, frequent cough, with aphonia, oppression, a yellow, purulent expectoration, a heat, more or less urgent, in the sternal region, and the sides of the chest, and a slow fever, with an evening paroxysm, followed by night sweats. All these symptoms announced a phthisis, carried at least to the second stage. This young lady was excessively emaciated, and had been in this state eight or ten months. A great number of remedies had been vainly employed.

Thirteen moxas, applied on the sides of the spinous processes of the dorsal vertebræ, and the chest, and preceded by cupping with scarification, applied successively at convenient intervals, conducted the patient, after a treatment of eight months, to a complete cure. This lady has been since married, and has two children, who enjoy, with their mother, good health.

A second young woman, of the same age, and of a small size, having chestnut hair, and deeply marked with the small-pox, had already submitted to various modes of treatment, and passed several weeks in the *Hospital de la Charité*, when I was requested to take her under my care.

There was a prominence of the left side of the chest, the *scapula* projected, and the corresponding portion of the vertebral column, on the

same side, deviated, with a fixed, and permanent pain in this part. The cough was almost constant, and was often accompanied with hemoptysis; there was a continued fever, with a slight exacerbation in the evening, and night sweats. The emaciation was extreme, and the skin discoloured. The disease had existed about eighteen months; the physician who attended her in the hospital, considered the case incurable, and to have nearly approached its fatal termination. But these alarming symptoms were gradually dissipated by cupping and moxas, the number of which was carried to twenty-one. The gibbosity of the spine, and the deformity of the chest disappeared by degrees, under the influence of this treatment, which lasted, it is true, nearly two years. This young woman, who before stooped very much, became erect, her chest was enlarged, and she acquired that freshness and plumpness in her appearance, which is generally observed in persons in perfect health.

After having enjoyed, more than a year, every mark of perfect health, she was suddenly seized with the symptoms of *gastro-enteritis*, the progress of which was slow and gradual. The parents, unfortunately for the patient, supposing that the malady could not be attended by unpleasant consequences, contented themselves with employing



some trifling, common medicines, without calling in a physician, suffering the disease to go on. But, the situation of their daughter becoming more alarming, they determined upon calling in Doctor Desruelles, one of my old pupils, who administered with admirable zeal, all the best remedies indicated in her situation. But, notwithstanding the most assiduous attention, and the most suitable treatment, this young woman died of marasmus in less than seven weeks after the attack of this last disease.

On examining the body after death, we found that the left lung, which was originally diseased, had become sound, having contracted a great number of adhesions, by membranous leaves, with the pleura costalis. We also remarked, on many points of its parenchyma, contractions, and deep cicatrisations, where, undoubtedly, were situated, during the disease, so many purulent cavities. The whole mass of the viscus was reduced to at least one third of its natural volume. The cavity in which it was contained, was perceptibly much narrower than the other, and its walls very weak. This reduction was the effect of the cure.

We observed in the right lung, one tubercle hollowed out by a purulent ulcer, of several lines in diameter. The peritoneum, and intestines, were

in a state of suppuration, as well as the mucous membranes of these viscera.

A third patient also, of the same age and sex, H. B. on whom nature had lavished all her favours, was threatened with imminent danger from a consumption, very far advanced. It was even declared, at the last consultation held on this case, that art offered no further resources, in consequence of the advanced state of the disease, and the extreme debility of the young patient. However, being warmly solicited by her parents, to take her under my care, I yielded with reluctance to their reiterated requests, and undertook the treatment of this case in September, 1817.

I shall dispense with relating the symptoms of the disease; I shall only say that the young patient had a slow, continued fever, with an evening paroxysm; flushing of the face, painful and frequent cough, with expectoration of a viscid, greyish yellow substance, of a purulent character. There was oppression, extreme weakness, aphonia in the first degree, pain between the shoulders, and on the sides of the chest; the tongue, veil of the palate, and internal surface of the pharynx were covered with aphthæ, which appeared to extend towards the larynx: the nails of the fingers were curved. Twenty moxas, preceded by cupping

with scarifications, and a seton on the left side, conducted this patient, by degrees, to an unexpected cure. The treatment had been continued for eighteen months, and she enjoyed a good state of health. But since the period when I recorded this case, and after a year passed in a very satisfactory state, this young lady was seized, in consequence of some new causes, with an inflammation of the bowels, of which she died, notwithstanding all the usual remedies were employed with the most assiduous care. There did not remain at the time, a single symptom of the first disease.

The subject of the fourth case was a Belgian, named P——, thirty-four or thirty-five years of age, of a dark complexion, very irritable, and who had arrived at the second stage of a pulmonary consumption, which had existed for about two years. The principal symptoms of this disease were, a frequent and painful cough, with hemoptysis, which had occurred daily, and sometimes so abundantly, as to become a true hemorrhage. It was preceded by a febrile paroxysm, heat in the chest, redness of the tip of the tongue, and a circumscribed blush upon the cheeks. It was followed by an icy coldness of the limbs, syncope, and an almost entire cessation of the pulse. The patient was frequently in a very alarming situation. To

these symptoms were joined complete aphonia, and deep apthæ over the whole mucous membrane of the mouth, nasal fossæ, and probably also over the larynx and pharynx. There was no specific virus.

Notwithstanding the almost desperate state of this patient, and the unfavourable prognostic of several physicians, who had been called in, I determined to try the following treatment; it had for its basis, the repeated and successive application of cupping with scarifications on the back and chest, and fifteen moxas, which were suffered to suppurate slightly.

After the fifteenth application of the moxa, the hemoptysis was stopped, and returned no more. All the other symptoms disappeared gradually, and the patient returned home, after having been under treatment for seven or eight months. His health was soon re-established, and his usual plumpness returned; the voice only remained weak. One of the physicians, who had been consulted at first, Mr. Laennec, and had detected extensive cavities, in both lungs, having examined a second time, and with the same instrument, the whole circumference of the chest, recognized the cicatrization of these ulcerated points, and confirmed the cure

The subject of the fifth case, is a young woman of about twenty-seven years, a milliner, who was suffering from a consumption advanced to the third stage. She was in a state of marked marasmus, with continued fever, night sweats, and habitual expectoration of purulent matter. Menstruation had been long suppressed, and the *os tinæ* was nearly obliterated; it would scarcely admit a very small elastic gum sound. Besides the usual symptoms of consumption, there appeared between the posterior edge of the right scapula, and the spinous processes of the dorsal vertebræ, a rounded tumour, formed by the preternatural curvature of the posterior extremity of the third and fourth ribs; in the intervals of which, could be perceived a deep and obscure fluctuation. The slightest pressure upon this point, caused to the patient violent pains beneath the clavicle of the same side. This pressure excited a smart cough, accompanied with copious expectoration. The action of coughing communicated, upon this point, an impulse which could easily be distinguished by the finger. Even without the cylinder of Laennec, we could easily perceive that the lung of this side was excavated by a very deep and extensive cavity.

I was at last induced to take this patient under my care, by the repeated requests of her parents,

and by a wish to ascertain, if, in this very advanced stage of the disease, the moxa would have effects analogous to those which I had obtained from its application in diseases of the spine, in the very last stages. Before applying the moxa to this young woman, I wished to verify my diagnostic, by my friend Laennec, who ascertained, with me, the cavity of which I have spoken, by means of his cylinder. A memorandum was taken of this consultation, at which Doctors Ribes and Desruelles were present. At length I proceeded to apply the moxa, commencing at the tumour, about which I applied, in succession, six. From this I passed successively to other regions of the chest, which I supposed to be near the internal ulcerations. To my great surprise, the two first calmed the pain and spasm, and gave to the unhappy patient a more refreshing sleep than she had enjoyed for six months. This sensible amelioration encouraged me, and I continued the application of this remedy, with suitable modifications, until the fifteenth. The projection of the dorsal region formed by the ribs, gradually disappeared, the cough was calmed, the expectoration was diminished, and became of a better appearance; the appetite returned; in a word, the patient grew better and better, so that she left her bed, and walked about



the chamber. At length she became well enough to walk abroad for whole hours. She was in the fifth month of this treatment, when I requested M. Laennec again to see the patient. He found, as in the case of M. P——, that the deep cavities which we had before detected, in the superior and posterior lobe of the right lung, were obliterated and cicatrised. The very favourable state of the young woman, made her very anxious to go into the country. I the more readily consented, as her place of residence in Paris was unhealthy, and inconvenient for walking.

At first she found herself much better; she grew fat, and her cough almost left her; but having been exposed to the open air, during a stormy night, the wind having changed suddenly to the north-east, she was seized with a very severe attack of gastro-enteritis, which induced her to return to Paris. But, notwithstanding local bleeding, and other antiphlogistic means, she died on the seventeenth day after this accident, and in the ninth month of her treatment for consumption.

On opening the body, we found the right thoracic cavity considerably contracted; the superior half of the lung was retracted upon itself, compact in some points, and traversed by membranous adhesions. The inferior portion was sound; several

slips of false membranes established numerous adhesions with the pleura costalis. The bronchiæ of the left lung were filled with a purulent mucous substance; and we observed in the substance of the lung small suppurating points. The mucous membrane of the stomach and intestines was inflamed, and spotted with gangrenous points.

This dissection verified the prognosis of Laennec, and shewed the beneficial effects of the moxa in every stage of pulmonary consumption; since in this patient it had cleansed these ulcerated cavities, and caused their cicatrisation internally.

The subject of the following case was more fortunate; and, although the disease was equally advanced, it was conducted to a complete cure. He was one of the door-keepers in the King's Chapel, at Versailles. This man was of a phlegmatic constitution, and about twenty-eight years of age, with a tubercular consumption in the second stage, when he came to solicit my professional care, at the commencement of the year 1818.

The glands of the neck were engorged, and the countenance discoloured; he was oppressed, and tormented with a hard, and almost constant cough, followed by the expectoration of a matter of a greyish colour, and of a fetid odour. The mucous membrane of the throat, and the entrance of the



pharynx was sprinkled with apthæ; deep seated pains were felt in the back, and sides of the chest. There was constant fever, with an evening paroxysm, and followed by profuse night sweats; in a word, he had fallen into a state of marasmus.

As it appeared to me that this disease originated in a specific virus, or, at least, that this was the predisposing cause, I administered remedies suitable to combat this morbid cause, at the same time that I applied the moxas.

This topical derivative was applied, two at a time, at suitable intervals, and at proper periods, on each side of the vertebral column, and on the sides of the chest. The number employed was thirty-six. This treatment was continued for fifteen months, but it was followed by complete and unlooked for success. The functions of this patient were gradually restored; he has recovered his flesh, and now enjoys perfect health.

A young English lady, named Maria J——, uniting with a most agreeable person, every pleasing quality of mind and character, was equally happy in being cured of a similar disease, in the first stage. Only a half dozen moxas were required in this case. I have received several letters from this young lady, which inform me that she continued well.

I shall confine myself to these facts which appear to me sufficient to fix the opinions of practitioners on the efficacy of this cautery in pulmonary consumption. I should also have spoken of the advantages which might be derived from this topical remedy in hydrops pericardii and hydrotharax, if I had not mentioned it in several memoirs inserted in my campaigns, and to which I refer my readers. I will observe, however, that it is only when these diseases are in an incipient state, that this remedy can be expected to produce a resolution of them, of which I have had instances.

*Chronic and Organic Diseases of the Abdominal Viscera.*

1st. *Of the Stomach* —The engorgements of the coats of this viscus, and the scirrhus, which is ordinarily the result of them, constitute a disease which is almost always fatal in its termination. I have found, from experience, that all internal remedies are either useless or injurious.

It is this which has led to the belief, that these maladies are incurable, especially when the engorgement of the pyloric orifice has gone to the extent which renders the passage of the aliments difficult, or causes them to be rejected by vomiting.

However, I can assert, that even in this state, and in several instances, the disease has yielded, to the frequent application of moxa upon the epigastrium; the combustion of which was increased by the blow pipe, as in phthisis, in order that the caloric might penetrate more deeply. For the better appreciating the efficacy of this exciting and revulsive topical agent, I will now give a summary of the history of some cases, of persons affected with this chronic engorgement of the pyloric orifice of the stomach, in a very advanced state. At least, I had every reason to suppose this was the case, from the nature of the symptoms.

One of the first patients, affected to the extent I have mentioned, was the valet-de-chambre of General Ratty. He experienced, in the region of the stomach, a dull, steady pain, with eructations of a sharp taste, and disagreeable odour. He had frequent nausea, and shortly after having taken food, vomiting came on, and continued for a considerable time. The alvine evacuations were seldom and small, of hardened matter, except after taking some drastic purges, which the patient frequently did, by the advice of his physicians; after which there was a discharge, more or less abundant, which was often followed by a diarrhœa.

The patient was in a state of low continued fever, and extremely emaciated. When he was lying upon his back, there could be observed, through the abdominal walls, which were very thin, in the region of the pylorus, an ovoid tumour, situated transversely, and of the size of a hen's egg. Any pressure upon this point was painful. The liver appeared to me also to project beneath the margin of the false ribs, and I thought that the spleen, and mesenteric glands, were in a comparative state of obstruction. The belly was spotted with large varicose veins, and the skin over the whole body was dull, dry, and scaly. This valet-de-chambre, aged forty years, had made the last campaigns of Spain, Russia, and Saxony. It was, no doubt, owing to his exposure to different seasons and climates, during these campaigns, that we ought to refer the cause of this malady, being predisposed, probably, by a particular morbid principle.

After having applied cupping with scarification to the hypochondrium, the back, and the epigastrium, I commenced the application of moxa to this last region; and I insisted upon the application of this cautery until twenty-two had been applied, with the suitable modifications already mentioned. This treatment was continued for fifteen or sixteen

months, after which, this man found himself perfectly well; all the functions were restored; his flesh gradually returned, and he at present enjoys perfect health, two years after his cure.

I might relate a great number of other cases, of persons attacked with the same malady in different degrees, who were equally cured by the same means.

2d. Obstructions of the liver, spleen, or any other viscus of this cavity, may be combatted with equal success by the moxa, especially when the disease has not arrived at its greatest degree of developement.

I will relate a single example of chronic hepatitis, with abscess, which was made to terminate in a fortunate crisis, by means of moxa. The subject of this case is one of the conductors of the diligences between Paris and Rennes, named Ferlura. This man, aged about forty-five years, had complained for seven months of dull pains in the right side of the chest, which projected much more than the left, and suffered from obstinate constipation. He soon observed beneath the ribs of this side, a dense tumour, but little painful, at the bottom of which, he perceived slight lancinating pains. He called in a physician, who applied a plaster of hemlock upon the tumour, and prescribed eight

drastic purges. But the progress of the disease continuing uninterrupted, I was called in consultation. It had then arrived at its highest degree; all the right hypochondrium projected very much, and there could be perceived beneath, an ovoid tumour which detached itself from the edge of the sternal ribs, of the size of a fist. Its circumference was hard, and a deep fluctuation, towards the centre was evident. Mercurial frictions upon the tumour had been employed, and the attending physician had advised that a trocar should be plunged into the centre of the tumour, in order to discharge the purulent matter, which was suspected to exist in the tumour, that presented in fact all the signs of an hepatic abscess. Before making the opening, however, it was agreed to apply the moxa about its circumference, without employing any other topical remedy.

After the application of the second moxa, the patient perceived that the tumour had diminished in volume externally, but that the deep and lancinating pains had increased; he was also reluctant to try the moxa any longer. However, we determined otherwise, and three new cylinders were applied, at intervals of two or three days. After the fifth, the patient experienced a violent cholic, which was followed by repeated



alvine evacuations; at first, bile mixed with pus, afterwards the evacuations were entirely purulent. The quantity was estimated at about a pound. These discharges were followed by a total disappearance of the tumour of the hypochondrium, and internal lancinating pains, which the patient had incessantly experienced until that time.

It is evident that the moxa induced the adhesive inflammation which, unquestionably, took place between the interior wall of the abscess, and the corresponding point of the transverse colon, the coats of which ulcerated, and that the pus penetrated instantly into this intestine. I have reason to believe that the moxa is an excellent mode of producing resolution of engorgements of the liver, and even of favoring the passage of pus from hepatic abscesses into some of the external emunctories.

I saw in Egypt an hepatic abscess, open spontaneously into the transverse colon and evacuated by the intestines.\* A third patient affected with hepatic abscess was treated in our hospital by the same means, in this case the evacuation of the pus was also through the alvine passages. The case is preserved by one of my pupils.

\* See the first volume of my Campaigns.



3d. We may produce a salutary revulsion in chronic engorgements of the uterus, which are almost always followed by cancerous ulcerations, by the application of moxa upon the lumbar region, preceded by cupping in this region and depurative medicine. I have removed this disease, or prevented its attack by these means in several women, who had strong symptoms of it.

I am now about to speak of phthisis of the bone; or of that asthenic, rheumatic, or scrophulous affection, which generally attacks young persons in the fibro-cartilaginous and boney structures, such as the spine the junctions of the bones of the pelvis, and the articulations of the extremities.

### *Of Rachitis.*

The effects of rachitis are, softening of the bones, curvature of the vertebral column, and more or less gibbosity. The moxa is, without question, the best remedy against this disease. Ancient and modern authors, especially Pouteau, have spoken in the highest terms of it; but the illustrious Desault has informed us that the success of this remedy is most certain, when, contrary to the opinion of the celebrated surgeon

of Lyons, the wounds, or eschars made by the moxa, are not suffered to suppurate, for the reasons already alleged. In this intention, we apply the ammonia upon the eschars immediately after the combustion of the moxa. The application is to be repeated, as often as the disease requires it.

It may be employed in any stage of the disease; it is however preferable to use it in the early periods, and before the deformity has become considerable. It is necessary to avoid placing the moxa directly over the spinous processes of the vertebræ, lest they should become denuded and carious. It is desirable to make the application as near as possible upon the course of the posterior branches of the vertebral nerves, between the transverse processes, so as to communicate, at the same time, with the spinal marrow.

Corsets, or other mechanical means, except they are employed as retentive bandages, or mere supports, are in this case more pernicious than useful. They will serve, to a certain extent, in pressing down the curvatures or projections of the bone; but if the morbid process continue, the disease will develop itself towards the opposite points, so as to affect the integrity of the internal

organs. It is necessary, therefore, to proscribe the use of these machines; and limit ourselves to the moxa, and internal remedies which will have a tendency to second its effects. The intervals, between the applications, should be proportioned to the age and strength of the subject. It will be better that the treatment should be prolonged, than that the patient should be exposed to accidents arising from inflammation, or a traumatic fever, produced by a great number of applications with too short an interval between each. I could relate a great number of cases of the successful application of the moxa in this disease.

### *Rachialgia.*

The moxa is especially imperiously indicated in dorsal consumption. I shall take the liberty here of making a slight digression upon this alarming disease, and which has been considered, by almost all physicians, as fatal. It has been designated by the names vertebral disease, curvature of the spine, or *maladie du Pott*.<sup>\*</sup> Notwithstanding the interesting cases and remarks made by this physician upon the disease, it is not generally detected

<sup>\*</sup> See the Works of this author, vol. iii.

until it has arrived at its third stage, when the resources of the art promise much less than at the first attack.

Until the time of Pott, very vague and uncertain notions were entertained respecting diseases of the spine; the effect was often mistaken for the cause. At this time even, some distinguished authors and practitioners consider abscesses by congestion, which are constantly the result of caries of the vertebræ, as a separate and independent disease from that of the spine.\*

The researches made by me, during thirty years practice in camps and military hospitals, have enabled me to verify the principles of the celebrated English physician; and to analyze, in the most minute details, the phenomena presented by this malady at its different periods. My numerous experiments have also made me acquainted with a most powerful remedy against it;—the repeated application of moxa. This indeed is the principal object of the present work.

It appears to me desirable to change the inappropriate names by which the disease, of which we are now about to treat, has been designated, and to substitute one which shall indicate its true character. As it consists in an inflammation of the

\* The Pathology of Boyer.

organic vessels of the fibro cartilaginous and osseous tissue of the vertebral apparatus. or of the boney pieces of other parts of the trunk, I will, therefore, call it according to its seat, viz: *rachialgia*, when it attacks the spine; *sacro-coxalgia*, when it seizes the sacro-iliac suture; *sternalgia*, in the sternum; *costalgia*, in the ribs, or their cartilages; *scapulgia*, in the scapula; and *femoro-coxalgia*, when it fixes itself in the coxo-femoral articulation, &c.

I designate by the term *rachialgia*, that rheumatic or serophulous affection, established in one of the points of the vertebral column, the principal effect of which is a latent or chronic inflammation in the fibro-cartilaginous and boney tissues of the vertebræ; it is a true phthisis. This inflammation, so far from increasing the volume of the parts. by engorgement, weakens their tissue, and appears to accelerate the process of absorption and decomposition; so that the bodies of the vertebræ, where the alteration first takes place, by degrees become softened. The spinous processes have a tendency to separate, one from the other, and project backwards, or press forwards, or to the right or left; this is marked by the gibbosity in different directions. The intervertebral cartilages are first decomposed or dissolved; to this

effect, absorption, erosion or caries of the osseous substance, in corresponding points, soon succeeds, and develops itself, more or less rapidly, according to the intensity of the causes, the age, and idiosyncrasy of the individual; the caries rarely attacks the spinous or transverse processes.

At the first moment of the erosion, there is emitted, by all the diseased vessels, a purulent, serous fluid, which accumulates at first under the membranes, or investing, ligamentous texture. Afterwards it becomes extravasated through the cellular structure towards the most depending points, or towards those where it meets with the least resistance; and accumulates at places more or less remote, where it produces what is called symptomatic abscess, or abscess by congestion. These abscesses, as was ingeniously observed by the English author, are constantly the result of caries; or are one of its principal effects. The progress of these abscesses vary infinitely; most generally they take place in the scapular or dorsal regions; the matter spreads through the interstices of the muscles, tendinous attachments, and transverse processes; accumulates in sinuses formed by the aponeuroses of the large muscles of the back; sometimes the pus passes under the pillars of the diaphragm, follows the direction of the psoas muscle,

and collects in the fold of the groin, or passes through the pelvis to the nates. In other instances, it follows the direction of the ribs, and goes to form collections on some of the anterior parts of the chest. Indeed, nothing can be more irregular than the course of these inflammations, and the development of the abscesses which result from them. This circumstance should render the practitioner very circumspect in his prognostic, as well as in the employment of remedies.

The symptoms which first indicate the existence of this disease are, obscure, deep seated, local pains. They at last become increased, and are propagated in the course of the spinal marrow, and nerves which emanate from it; especially those which go to the extremities nearest to the disease. The action of the muscles of these parts becomes impaired, without being paralyzed; spasmodic pains, and a sort of tension, (*roider*) or accidental retraction, with a sensation of cold, independent of the temperature of the air, are experienced in these limbs. To these symptoms are added dullness, oppression, loss of appetite, emaciation, slow fever, with irregular intermissions, followed by colliquative sweats and marasmus.

I shall enter more into detail respecting the progress of this disease in speaking of femoro-



coxalgia; the same kind of affection, when it attacks the coxo femoral articulation.

I shall only observe here, that the cauteries recommended by Pott in rachialgia, do not possess the advantages that I have derived from moxa. The copious suppuration which the first sort of cauteries occasions, weakens the patient very considerably, without producing the desired revulsion, especially if there be symptomatic abscesses. If these abscesses are opened early, before efficacious means have been employed against the caries, whatever may be the process, the patient dies very soon. Now in the administration of these means, it is necessary to endeavour to stop the process of suppuration; it is sufficient to produce an excitement on the parts affected, to divert the morbid principle, and to change the vital properties of the inflamed parts. Moxa, preceded by cupping with scarification, fulfils this double indication. I shall now content myself with pointing out the causes of diseases of the spine, and making known my mode of treating abscesses by congetion, which are the principal effects of them.

The causes of rachialgia are a rheumatic, or scrophulous vice, and, generally, every thing which can contribute to destroy the vital forces

of the vertebral apparatus. The development and progress of this affection are slow, but it is rare that it is stopped in its course, or cured spontaneously. It is one of those diseases from which nature is incapable of extricating itself, without the assistance of art; its consequences also are generally fatal. It is important therefore to hasten the employment of suitable means to combat this morbid cause; experience has taught me that the most powerful and efficacious is moxa.

A great number of patients, whose situations were considered desperate, have owed their safety to this heroic remedy. I will now give a summary of several which confirm this truth. I shall afterwards have occasion to return to the theory of the disease.

*Case 1st.* General L——, exhausted by a variety of debilitating causes, was attacked with a dorsal consumption, slow fever, great loss of power in the genital organs, curvature of the spine, uneasiness and numbness in the lower extremities, and marasmus in the first degree. This affection had resisted a great number of remedies. It was decided in a consultation that a series of moxas should be applied upon the vertebral column, and the region of the sacrum,

without discontinuing the bark and ferruginous preparations at that time administered. With the three first applications a favourable change took place; the strength of the patient returned in proportion as the applications were repeated. At the seventh he was in a state to walk alone, and by the thirteenth he was in a situation to go to the mineral waters to complete a cure, already far advanced. He has made several campaigns since.

*Case 2d.* Mademoiselle D——, aged about twenty-five years was in the first stage of marasmus, with strong symptoms of pulmonary consumption. The dorsal vertebræ were curved backwards, and towards the right side. The scapula of the same side was detached from the trunk about three centimetres,\* by a soft tumour, or incipient abscess by congestion. These symptoms announced the first stage of a caries of the vertebræ. In a word, this young lady was approaching rapidly the end of her career when I was called to see her.

The debilitating regimen to which the patient had been subjected for several months, was replaced by one that was tonic and nourishing; the bark combined with opium and balsamie

\* A centimetre is the .39371 part of an English inch.

and gummy substances were prescribed. Twenty moxas were applied successively, after intervals of three or four days, upon the sides of the spinous processes of the dorsal vertebræ, near the spaces which separate the transverse processes. The first favourable change, was the sudden and entire cessation of the symptoms of pulmonary consumption, and, soon after, a reduction of the projection of the dorsal vertebræ, the resolution of the subscapular tumour, and the return of the scapula to its natural situation. By degrees, the general powers of the system returned, and the internal organs recovered their functions; in a word, this young lady now enjoys perfect health.

I am now about to give an account of a disease nearly resembling the preceding; the case occurred in the military hospital of Gros-Caillou.

*Case 3d.* Joseph Richaulet, about twenty-three years of age, a cannoneer in the foot guards, in February, 1816, had a tumour of the size of the two fists, and of an oval form, situated behind the spinal edge of the right scapula. It extended from the base of the spine of this bone, to below its inferior angle. There was a fluctuation through its whole extent, without pain or change of colour in the skin. The patient was constantly bent; the spinous processes of the dorsal vertebræ were pro-

minent and separated, and this portion of the spine deviated a little towards the side opposite the tumour. When the points corresponding to these vertebræ were pressed a little, the patient felt a violent pain, accompanied with a sense of weakness, which approached to syncope, when the pressure was prolonged. This tumour, and the other symptoms which accompanied it, enabled me easily to recognize a disease of the spine, in its second or third stage. It was the result of a rheumatic affection, which this soldier had contracted in the cold and humid bivouacs of the campaign in France, in 1814.

The condition of the patient was so desperate, that I did not expect any success from the employment of moxa; nevertheless, I resolved to try its effects. At the third application, which I made with an interval of two or three days, along the course of the dorsal vertebræ, which appeared to be the most affected, the patient found himself relieved. The tumour diminished slightly, and it was at this time that I caused a drawing to be made of it.\*

I prescribed anti-scorbutics, and the continuation of the moxa, until twenty-four were applied. The last were applied over the external wall of the

\* See the plate in the 4th vol. of my Campaigns.

purulent sac, which prevented the approach of the walls of the tumour. The cure of this soldier was complete on the 23d of July last.\* He has experienced, during the course of his disease, a shortening of his height about two centimetres.

This patient was presented to the Society of the Faculty of Medicine before and after his cure.† In vol. ii. page 396, et seq. of my Campaigns, may be found many cases which establish the happy effects of moxa in rachialgia, or dorsal consumption, with incipient caries, and abscesses by congestion, which are the consequences.

After having used the moxa until the progress of the disease was arrested, I have opened the abscess, in some cases, in the manner described in the work above referred to. It consists in making an oblique opening into the abscess, by means of a narrow knife, heated to incandescence; all the purulent matter contained in the sac, should be evacuated instantly by dry cupping, and a slightly compressive bandage applied.

The following cure, with those which are related in my work, making known this process more in

\* See my Campaigns.

† Lady Morgan, in her work on France, has testified her admiration of the remarkable cures obtained in cases of this kind, by the aid of moxa, a remedy at present not used in England.

detail, will certainly justify the principles already laid down.

*Case 4th.* Peter Moussot, aged twenty-four years, of a phlegmatic-bilious constitution, a fusilier in the sixth regiment of the royal guard, in the cold and wet bivouacs of the campaign of Saxony, towards the end of the year 1813, contracted a rheumatic affection, which became fixed about the back. The only symptoms which remained of this affection, not relieved by rest and a better regimen, were some periodical pains about the same point; but suddenly, in the winter of 1815, they were renewed with more violence. In May, 1816, this soldier was transported from the fever ward, where he had been under an anti rheumatic treatment, into mine. He had then a considerable tumour between the spine, and the posterior edge of the scapula. I recognised, at the first inspection, the malady of Pott, arrived at the first stage; characterized by gibbosity, deviation of the spine towards the left side, paralysis of the body of the bladder, and of the inferior extremities.

The dorsal tumour was of an oval form, about three centimetres in its greatest diameter, and projected nearly as far. The fluctuation was uni-



form through its whole extent. The skin was not discoloured.

I commenced the treatment by applying along the whole course of the vertebral column, dry cupping, and cupping with scarifications, and afterwards moxa, with the usual remedies.

A favourable change was produced by the first applications, and the patient continued to improve. However, the tumour, the volume of which underwent a rapid diminution by the fourth application, went on much more slowly afterwards, until the twenty-first, and then remained stationary until the twenty-fifth of July, when a small phlyctena suddenly appeared in the centre of its surface, and announced to us a spontaneous and immediate opening of the abscess. Under this conviction, I hastened to plunge in a narrow bladed knife, heated to incandescence, making an incision about a centimetre and a half in length, commencing at the phlyctena, and directing it towards the most depending part of the tumour. A vessel which would contain about a pound, was soon filled with a serous, inodorous substance, of a white greyish colour, and mixed with albuminous flocculi. A cupping glass applied over the opening, removed the little fluid which remained in the cavity. In this part of the fluid, osseous, friable grains were

observed, which I supposed were the remains of the carious portion of the body of one of the vertebræ.

This operation threw the patient into a state of extreme debility during four days, which I opposed, by an antiseptic draught, and a strengthening diet. A febrile state then announced itself by frequent chills, followed by intense heat. It was accompanied with a painful sense of constriction in the hypochondriac regions, with dyspnœa, slight cholic, diarrhœa, and tenesmus, the urine small in quantity, and of a reddish brown colour.

There was every reason to believe that, from the aberration, or metastasis of a very acrid principle, from the carious body of the vertebra, to all the mucous membranes, there had taken place in all these membranes, a chronic inflammation, which was the source of the symptoms described.

The application of cupping with scarification, and large vesicatories upon the thorax and belly, together with the administration of mucilaginous anodyne substances, dissipated the imminent danger by which the patient was threatened, and restored him to a favourable state. Afterwards, for the purpose of favouring the adhesion of the walls of the sac, I applied new moxas.

By the twenty-fifth of November, 1816, the patient might have been considered as being nearly cured. He walked well, but was unable to bend the trunk forward or sideways, in consequence of the anchylosis of the boney parts originally affected by the caries. His height was shortened about four centimetres. It is evident, that in this patient, who was perfectly cured, after a treatment of two years, the caries of the cartilages and bodies of the vertebræ must have been very extensive, seeing there was so great a loss of substance.

Another process will be still more advantageous, if the fluid contained in the abscess has spread into a portion of the cellular tissue, which communicates with the purulent sack. This consists in passing a seton through the cellular tissue; the fluid will pass out at the same time by both the wounds, and will continue gradually to ooze out, until it is entirely evacuated. Then, if the caries of the bone which had furnished this fluid, be stopped, as we must suppose in this case, the complete cure of the patient will be the more certain, as the matter of the abscess will be evacuated gradually, and without allowing the external air to communicate with the purulent cavity. Two patients, who have been treated with advantage by this method, will be spoken of hereafter.

*Case 5th.* Thomas, a fusileer in the fifth regiment of the guard, aged twenty-two years, had experienced frequently after bivouacs rheumatic attacks, with violent pain, which in the summer of 1816 returned, principally at the upper part of the back. There appeared at the same time, between the left scapula and the superior dorsal vertebræ, a tumour, the progress of which was rapid and remarkable; so that in fifteen days after its appearance, it had acquired a considerable volume, and presented an evident fluctuation over its whole extent. The upper part of the dorsal column was strongly projected forward, so as to form a concavity behind. This appearance, extremely rare, was owing, no doubt, to the alteration in the posterior part of the body of the vertebra, so that the spinous processes were made to approach nearer to each other, while the anterior part of the body of each vertebræ had a tendency to separate from the corresponding part of the bone placed above and beneath it. The superior extremities were in a state of almost complete paralysis. Twenty cuppings, and thirteen moxas, were successively applied about the tumour in the space of two months. As the number of these applications increased, their efficacy was manifested by the diminution of the pains, the reduced

size of the tumour, and the returning power of the superior extremities. By the twentieth of November, the tumour was one fourth of its original size, and the patient getting well. This soldier having been discharged from the service, returned home, where the cure was, no doubt, completed.

*Case 6th.* Dulard, a curassier of the guard, having been subjected to the pernicious influence of the cold bivouacs in Russia, was attacked with a fixed pain in the lumbar region, with a remarkable numbness, and very great debility in the inferior extremities, which terminated in an almost complete paralysis.

The physicians of the Bourbonne-les-Bains, to whom this soldier was sent, considered and treated it as a paralytic affection; but this was useless. When he was brought to our hospital, I recognised, by the symptoms already so frequently mentioned, a well marked case of rachialgia. The three first lumbar vertebræ formed a prominence of about three centimetres; the slightest pressure on the diseased part, caused severe pains, as well as weak convulsive motions in the lower extremities. The application of cupping, which I ordered to be repeated during five or six days, along the spine, the hypochondria, the flanks, the nates, and the thighs, was so evidently beneficial, that I was

enabled to commence the employment of the moxa, and to substitute for the cooling remedies, until then employed, tonics administered with modifications suited to the indications.

Fourteen moxas applied successively along the sides of the tumour, and towards the regions of the back and sacrum, together with the cupping, entirely removed the complaint. The contractile action of the extensor muscles of the lower extremities, particularly affected by the paralysis, was restored; and progression, and the other functions, were re-established; so that by the twentieth of November, the patient was in a good way to be cured, and he left the hospital in a few weeks after.

*Case 7th.* Labaudre (Blaise,) aged twenty-eight years, a soldier in the first regiment of infantry, of the royal guard, after great indulgence, first observed, about six years since, pains in the back and pelvis.

He was transferred, on the seventh of September, 1817, from the military hospital of Val-de-Grace, where he had been for about six months, to that of Gros-Caillou. There was in the left inguinal region an abscess by congestion, of an oval form, of the size of the two fists, with evident fluctuation through its whole extent, the skin not



at all discoloured. Already one of the most projecting points of the abscess was almost open, and was accompanied with pains about the hip and thigh of the same side, and the dorsal region.

A distinct prominence, projecting about two centimetres, formed by the separation of the spinous processes of the last dorsal vertebræ, shewed that the nature of the original lesion had been mistaken at the hospital of Val-de-Grace; of which the abscess was but a symptom, as this tumour originated in the caries established in the bodies of the dorsal or lumbar vertebræ.

Dry and moist cupping, applied over the whole dorsal region, and especially at the sides of the swelling, overcame the chronic inflammation, and relieved the patient. After the application of nineteen moxas, the tumour, which at first was a little diminished in volume, remained stationary, and the point of which I have spoken, appeared again ready to open; I was induced to pass a seton through the integuments and cellular tissue of the groin of the same side. I took care to comprehend in the perforation, the deep cells of this region, with which the purulent matter enclosed in the sac appeared to me to communicate. In evacuating gradually and indirectly all the fluids, I endeavoured to avoid a direct opening into the



tumour, in consequence of its softness, and the thinness of its walls, as well as from its being so immediately connected with the abdominal viscera.

However, notwithstanding the remarkable reduction of this abscess, its walls became so much absorbed, as to induce me to apprehend their opening spontaneously. This circumstance determined me to plunge in a knife, heated to incandescence, in the manner above described.

During the three first months which followed the operation, the patient was as well as could be expected, in a person in his situation. The suppuration, though abundant, was of good quality; the symptoms of fever, arising from absorption, were dissipated; all the functions were performed well, and Labaudre began to walk about his ward. But he no sooner found himself out of danger, and in a way to get well, than he returned to his intemperate habits, giving himself up to intoxication. He was attacked a few days after these excesses by violent cholics, scalding of the urine, and a comatose affection. The suppuration of the wound, which was fistulous, became entirely suppressed, and metastasis to the lungs and brain, manifested themselves at nearly the same time. The functions of these organs were disordered, and gradually weakened, and, after a month of

anguish, the patient died with marasmus and exhaustion.

Twenty-four hours after death, we examined the body, which was livid, the limbs were flaccid and flexible. The viscera of the belly and chest presented nothing very remarkable; the cranium was not opened, but there was reason to suspect a purulent state of the brain, from the paralysis of all the muscles of the extremities, and the symptoms of cephalalgia and mental aberration, which were manifested before death.

After removing the abdominal viscera, we discovered, as I had asserted at the moment the patient entered the hospital, a purulent sinus, which extended from the fistulous wound in the left iliac region, along the psoas muscle, and behind the peritoneum, to the bodies of the second and third lumbar vertebræ; the remaining portions of which had approached and formed a mutual adhesion. The cavity which arose from the loss of substance was invested by a ligamentous covering; osseous vessels projecting from both pieces, formed on the sides two small bridges; while the central points approached each and formed a sort of ankylosis. The reader may see a representation of this morbid structure in the fourth volume of the work already referred to. It shews unequivocally that

caries of the vertebræ, however extensive, may be arrested, and that those parts destroyed by this ulceration may be cicatrised; as happens in venereal caries of the cranium, when properly treated.\*

It is evident that the caries had been arrested in the case of Labaudre; that the bony portions, destroyed by this affection, had become cicatrised and united, and that nothing was wanting in this

\* I have attended three soldiers, who in consequence of a constitutional syphilis, had the cranium furrowed out at several points; in one, through the whole thickness of the external table and diploe of the frontal bone; in another it had extended its ravages into the sinuses of this bone, causing a great loss of substance; in the third there was caries of the frontal and occipital bones. All three now enjoy perfect health. The loss of substance or furrows, which resulted from these caries, could be observed both by the eye and touch, under the integuments, which adhered closely to them. The moxa is not indicated in these sort of caries. It accelerates its progress, unless the cause of it is destroyed, or opposed at the same time by specific means. I shall not terminate this note without speaking of the treatment that I have adopted in syphilis, and employed with great success in the hospital, the surgical department of which has been entrusted to my care for twenty years. This treatment, which I divide into internal and external, consists in the internal administration of the deuto-chlorate of mercury, hydrochlorate of ammonia, and gummy extract of opium in equal parts; six, eight, or ten grains of this mixture, dissolved in a sufficient quantity of Hoffman's liquor, are sufficient doses for a pound of sudorific syrup, or distilled water. The syrup is given in a dose of from half an ounce to two ounces. The second preparation is administered in doses of from two drams to an ounce, in an appropriate mucilaginous fluid, as milk. Mercurial frictions of from one to three drams on the soles of the feet every three or four days, followed by saponaceous lotions and exercise, constitute the external treatment.

patient for completing the cure, as in the preceding cases, but the detergence of the purulent sinus, which had disorganized the cellular tissue of the psoas muscle, and the iliac region, where the abscess discovered itself.\* This fact proves, in a word, that these diseases are curable when we have the courage to persevere in the employment of moxa, and when in opening the abscesses, which are the consequences of the caries, we take care at once to remove its whole contents, or make use of a seton. I shall terminate this part of the subject by a summary of two extremely curious cases.

*Case 8th.* John Joseph Bulliard, about twenty-one years of age, tall, and of a light complexion, and a lymphatic constitution, a soldier in one of the Swiss regiments of the royal guard, entered the military hospital of Gros-Caillou, the sixth of December, 1818, to be treated for two abscesses, which had been remarked for some months. The largest was situated on the dorsal region, and the second on the upper portion of the sternum. The left knee of this patient was tumefied, and the motions of the joint very imperfect. The ninth, tenth, and eleventh dorsal vertebræ, formed a con-

\* A soldier in the second regiment of the royal Swiss Guards is now under the same treatment at the hospital of Gros-Caillou, for a disease exhibiting the same symptoms. He is in a way to get well.

siderable projection, and the slightest pressure upon the spinous processes of these vertebræ, caused the most violent pains. He was emaciated, discoloured, and had a fever, with slight remissions, &c.

From all these symptoms, I became convinced that this young Swiss was affected with an osseous phthisis; established in the bodies of the last dorsal vertebra, the sternum, and the femoro-tibial articulation, with symptomatic abscess, or abscess by congestion. This disease, which had already arrived at the second stage, was caused, no doubt, by a scrophulous diathesis, and onanism, to which he had completely given himself up.

After observing the patient for some days, I prepared him to receive the moxa, the application of which, at first, appeared to him extremely severe. He however, became gradually accustomed to it, and at last suffered all the necessary applications to be made, with great courage and constancy. At first, I attended particularly to the treatment of the tumour over the sternum, about which I applied twenty Chinese moxas. I afterwards opened the symptomatic abscess, which was about the size of a large hen's egg, by means of the caustic potash.

The purulent matter being evacuated, and the cavity cleansed, there was discovered a carious point in the sternum, which was the origin of the abscess. The diseased portion of the bone cleansed itself; portions of the compact lamina of this bone exfoliated, and afterwards cicatrized; and, though the soft parts remained for a long time ulcerated and fistulous, they, like the bone, also healed up, under the salutary influence of new Chinese moxas placed around the part.

The tumour of the back had acquired, in the mean time, so considerable a size, that it resembled, both in volume and appearance, the head of an infant. I placed along the sides of the whole vertebral column, commencing at the upper part, and about the tumour, thirty moxas of cotton, using the blow pipe. The first having relieved the patient very much, he was encouraged to suffer the applications to be continued. Pills of the extract of hyosciamus, nitrate of potash, and camphor, and some particular precautions, relieved this young man of the pernicious habit which he had contracted. I continued the treatment with security, and all the success that one could expect.

The abscess on the back remained stationary; and, as the most projecting point exhibited indications of opening, after having arrived at the



thirtieth moxa, and four months attention to the case, I determined to operate according to my method, that is with the lancet heated to incandescence. I selected one of my clinical days for performing this operation, which was followed by the discharge of about a pint and a half of fluid, similar to that evacuated from the abscess of Labaudre. The dressing being completed, I took all the necessary precautions to prevent accidents, or to remove them. A regimen similar to what has been described in the preceding cases conducted him, with some interruptions, to the desired end. He walked better and better, and after a year's treatment, he found himself, as far as regarded the rachialgia, in a way to get well.

But the tumour of the knee had increased in the same proportion, notwithstanding all the usual remedies had been employed. However, I did not wish to remove this focus of morbid action before the rachialgia was entirely cured, for the same reasons that I did not attack this last, until the sternalgia was relieved. I continued, therefore, to devote my attention to the dorsal disease until it was cured; which was far advanced by the end of the spring of the year 1820. The disease of the knee, in the mean time, having made great progress, and being convinced that the caries had



attacked, deeply, all the articulating pieces, I determined to amputate the thigh, which the unhappy patient had long desired. The operation, though performed with precision and method, was followed by a very alarmingly conical state of the stump (*conicite*.) Several physicians, who attended my Clinical Lectures on Surgery, were strongly under the impression that I should be obliged to have recourse to another operation, but I assured them that this would not be the case. I had been taught by experience, that this projection of the bone, being the result of local irritation, and the collapsed state of the cellular tissue, would cease with the exfoliation of the cut extremity of the bone; and that then, there would not be any longer any cause of irritation; because the muscular fibre being then swelled out, and separated by the fatty substance filling anew the cellular tissue, the soft parts would be brought back towards the end of the stump, and restored to a level with the cut extremity of the femur. Thus, a second operation, so much extolled by some authors, and many practitioners, is not only useless but may be dangerous. It is useless, inasmuch as it is extremely difficult, not to say impossible, to make the saw fall exactly above the points of the sequestrum (*sequestre*;) as the ne-

crosis takes place in the cylinder of the femur, at unequal distances from its extremity; and, however little of the *sequestrum*, or dead bone, may escape, both nature and art would have much greater difficulty in removing it, than if the sequestrum remained entire. With respect to the danger of a second operation, it would be proportioned to the hemorrhage, or inflammation of the fibrous membranes which might accompany it. All these considerations will be developed in a separate memoir on this accident.

This phenomenon was exhibited in a very remarkable manner in Bulliard, and in one of his comrades, whose thigh I also amputated for a similar disease. Thus, the portion of the dead bone being exfoliated, the soft parts of the stump came to be upon a level with the remaining sound bone, and perfectly healed. In a word, this patient left the hospital, at last, extremely well, on the first of August, 1820. He had lost about three centimetres of his height; his natural plumpness was restored, and every thing announced that this soldier, who has now returned to his native country, in company with the subject of the following case, enjoyed good health.—This cure is remarkable in various respects.

*Case 9th.* The success I obtained in the following case is not less surprising, though there is but little resemblance between it and the preceding, in the nature of the disease. I will give a summary of it, because the moxa contributed much to the safety of this soldier.

Louis Stobler, aged about twenty-one years, one of the soldiers in the first regiment of the royal Swiss guard, in a paroxysm of nostalgia, threw himself from the third story of his barrack, with the intention of breaking a leg, so that he might be sent home. It is easy to anticipate what must be the result of such a fall, the principal effect of which was concentrated in the right leg and kidneys. This limb was broken in its inferior third, and the first lumbar vertebra was luxated anteriorly upon the last dorsal vertebra. The deep depression which was observed behind the first, and the unnatural projection formed immediately over the spinous process of the last vertebra; the sudden and complete paralysis of the lower extremities, intestines and bladder; the pains and death-like coldness left no reason to doubt concerning the nature of this luxation. Although I had no hopes of preserving this young soldier, after having restored him by suitable

means, I endeavoured, as soon as possible, to fulfil the indications which presented themselves.

I applied at first several series of cuppings, with scarification, along the lumbar region and all around the belly. I afterwards enveloped this person in the skin of a sheep recently killed, while it was still smoking. After this application, I had recourse immediately to embrocations of camphorated oil of camomile very warm. All attempts at reduction would have been useless and injurious. Two bleedings from the arm, and a third from the jugular, to relieve the effects of the concussion, which had been violent, were successfully practised, and the patient put upon cooling and antispasmodic drinks.

Although the comminuted fracture of the leg indicated amputation, I deferred it from the slight hope of safety which the wound offered; I contented myself, therefore, with the application of the apparatus which I am in the habit of using in such cases. However, the patient having recovered the use of his senses, and having passed five or six days without any increase of the alarming symptoms already mentioned, I conceived some glimmering hope of saving him by the most assiduous care. The paralysis of the extremities and abdominal viscera was carried to such an

extent, that the patient had no sensation of pain in the limbs, notwithstanding the fracture and heat applied to ascertain their insensibility.

The retention of the urine was readily relieved by means of a gum elastic catheter, which was allowed to remain in the bladder. But purgative enemata has not sufficient power to relieve the obstinate constipation, which this poor young man experienced after his fall. I was under the necessity, not only of relieving the rectum of the hardened fœces, with which it was filled, by means of a scoop made expressly for the purpose, but I was also compelled to extend the scoop to the sigmoid flexure of the colon, which was also so full that it projected into the left iliac region through the abdominal walls.

After twenty days of care, and tonic frictions and embrocations over the whole body, there was a sensible improvement, and the excretions began to return. However, there still remained a great debility in the lower extremities, and fixed pains at the point of the luxated vertebra. I then commenced the use of moxas, which I applied, two at a time, along the sides of the last dorsal, and first lumbar vertebræ. By the time eight moxas were applied, the sensibility and muscular motion of the inferior extremities returned, and after eighteen

months treatment, the patient would have been able to walk, but for the deformity and contraction of the fractured leg and foot. He desired that the limb should be removed by amputation, an operation which I had, for some time, considered unavoidable. I performed this operation in the thick part of the condyles of the tibia, as the disease extended very high. Nothing interrupted the healing of the stump, the cicatrix of which was linear.

The motions and animal sensibility of the parts, which had remained long in a state of paralysis, were gradually restored, and the patient, after having moved about with difficulty by the assistance of crutches, was enabled at last to walk very well with a wooden leg. At the end of two years, this Swiss arrived at a perfect cure. He became about four centimetres shorter than when he first entered the regiment. The last false ribs are but a finger's breadth from the crest of the ilium and there remains a deep depression beneath the spinous process of the last dorsal vertebra, which projects very much.

This is the third case I have had of a luxation, which I have believed to be complete, of one of the dorsal, or lumbar vertebræ, produced suddenly by mechanical causes. The two first are



inserted in my Campaigns; and the patients are in the *Hotel Royal des Invalides*. The curious phenomena which these last exhibit, will constitute the subject of a memoir which I propose to publish on the consequences of these luxations.

### *Sacro-Coxalgia.*

Rheumatism sometimes produces such effects upon the sacro-iliac synchondrosis as to cause, especially in young subjects, a gradual separation of these two bones, and, of consequence, a sort of spontaneous luxation. This, indeed, is the only articulation in the osseous system, where such a kind of displacement can take place. It is also true, that it is generally produced by a mechanical cause; such as falls, or violent compression exerted in a direction opposite to the line of connexion between the two bones. This luxation may also happen to very young women, in giving birth to uncommonly large children. I have seen examples of this; I have been even obliged to apply a retentive and compressive bandage in a young woman of seventeen years of age, after a laborious labour, which caused a separation of the ilia with the sacrum, similar to what takes place in the female Guinea pig, during parturition.



The symphysis, however, united, and this young woman has been since very well.

The case communicated to the Academy of Surgery, towards the end of the eighteenth century, by M. L'Heritier, Professor in the School of Practice, is a striking example of this disease. The patient was a young farmer, who having for a long time suffered a rheumatic affection in the right sacro-iliac region, experienced such a separation of the two bones which form the symphysis, that the ilium moved with facility up and down. M. L'Heritier, after having used the actual cautery, ingeniously conceived the idea of fixing the two bones together, by means of an elastic bandage; the form and composition of which may be seen in the design which has been made of it, which may be found in the archives of the Faculty of Medicine of Paris. I have seen since, in two young soldiers, this dislocation produced suddenly by a spent ball, acting obliquely from above, downwards, upon the ilium. I might relate here in detail the case of a patient affected with the same disease, who I had under my own care, a short time since, at the hospital of Gros-Caillou.

In this affection, the corresponding limb becomes elongated, in proportion to the depression of the

ilium, if the displacement has taken place from above downwards; and the reverse.

The diagnostic in this lesion is difficult; however, the local pains increasing by direct pressure, and a manifest tumefaction in the sacro-iliac region, will authorize us to believe that it exists. It often happens, that this disease produces in the symphysis which unites the ilium to the sacrum, a caries similar to what takes place in the vertebræ; as I have described in speaking of rachialgia, and in the hip joint, or femoro-coxalgia, of which I shall speak soon.

If the malady be recent, it may be relieved by the means employed by Professor L'Heritier, to which may be added with advantage, the frequent application of moxa. If the disease be old, and especially with ankylosis of the bones in an unnatural situation, the disease is incurable.

The means pointed out in rachialgia, ought then to be employed in this affection, which is of the same nature. But I cannot too strongly advise avoiding that portion of the skin which immediately covers the bone; of consequence, we must choose the space which corresponds with the diseased symphysis, as it is indicated in the plates No. 3 and 4, of the fourth volume of my Campaigns.

The same kind of affection sometimes attacks also the sternum, the ribs and the scapulæ, as I have myself seen; and the result of this disease, established in the substance of one or more of these bones, is absolutely the same as in the preceding cases. We may also affirm, that the abscesses, which take place, more or less remotely from the focus of the disease, are constantly produced by the caries of these bones. These abscesses differ but little in their nature and development from those which accompany rachialgia, properly so called. The names of sternalgia, costalgia, and scapulgia, may be given to these diseases.

I have remarked, in all these cases, as in rachialgia, that when the opening of the abscesses takes place spontaneously, before the caries in the bone producing them has been stopped by the means above pointed out, the disease is always fatal. On the contrary, when the moxa is applied early in the complaint, so as to stop the progress of the caries, the operation of opening them is followed by happy consequences, of which I have seen numerous instances.

*Femoro-Coxalgia.*

I give this name to the latent or chronic inflammation which takes place in the fibro-cartilaginous and osseous apparatus of the coxo-femoral articulation; it is similar to that which has been described as attacking the vertebral apparatus, and the sacro-iliac symphysis. It is ordinarily the effect of a rheumatic affection, or exhaustion of the prolific powers of the patient. This disease may be an hereditary, or acquired scrophula; it is rarely syphilitic. It is necessarily hereditary, when it is the result of a scrophulous vice, as we see in children.

With these impressions, the means I employ in removing rheumatic femoro-coxalgia, a disease always accidental, are generally those indicated, with very few modifications, in the same disease when of a scrophulous character. Besides, the symptoms which accompany this disease in children, are the same as those produced by rheumatic femoro-coxalgia in adults, who have been exposed to those causes which develop rheumatic affections.

Rheumatic femoro-coxalgia rarely attacks very young or very old persons; it manifests itself.

generally, from the first period of puberty to the age of manhood, i. e. during that period of life when the process of ossification is nearly terminated. The development of this disease takes place more readily, when the subjects are exposed to vicissitudes of weather, the effects of which are felt on the fibrous and ligamentous systems. Young soldiers subjected to fatiguing marches, and long campaigns in cold climates, are the most exposed to it. I particularly observed this in the Russian campaign, which was long and laborious. In the greater number of these young soldiers, the disease being far advanced, and having been at first neglected, the result was unfortunate; however, I have had the happiness of treating many with unexpected success.

Before relating the cases of these patients, I will succinctly describe the symptoms of femorocoxalgia.—It announces itself by pains, more or less deeply seated, in the region of the hip joint; they are propagated shortly along the femur to the knee, where they are concentrated in such a manner, as to attract the attention both of the patient and physician, to the knee joint. This circumstance is frequently a source of error. The patient generally keeps the leg and thigh in a state of half-flexion; the motions are executed with

difficulty, especially those of complete flexion and extension of the limb, the nourishment of which is soon altered.

At first, the diseased limb becomes elongated, so that the lower extremities are of unequal length. This elongation is owing to the state of relaxation and paralysis into which the muscles surrounding the joint have fallen, and to the engorgement and inflammation of the synovial membrane. It may also be attributed to the state of the ligaments, and particularly that which attaches the head of the femur to the bottom of the acetabulum; upon the place of insertion, and upon the substance of which the rheumatic affection, more especially, produces its first effects, as well as upon the collection of synovial glands, which fills the sigmoid fossa of the articular cavity. During the first period of this morbid process, the pains are deep, the patient experiences a general uneasiness, and the functions of internal life are more or less disturbed, according to the irritability of the patient; febrile paroxysms supervene, with intermissions proportioned to their duration.

We may explain these last phenomena by the stagnation of the fluids which lubricate the joint, and the latent inflammatory state of the capsular ligaments, synovial membrane, and bones. The



cartilages do not force back the head of the femur by their tumefaction, as some authors have asserted, (see volume xv. p. 33, of the *Dictionnaire des Sciences Medicales*,) for I have uniformly found them, on dissection, rather thin and dissolved, than tumefied; their organization will not permit this tumefaction.

By this general change in the articular parts, the head of the femur is forced by degrees from the bottom of the acetabulum, and an elongation of the limb is produced; which becomes more remarkable, from the inter-articular ligament having lost all its elasticity, or from its being even detached from its point of insertion, either at the bottom of the acetabulum, or the head of the femur, which happens very early. Indeed, as soon as this ligament becomes separated at either of these points, the femur, in consequence of its curvatures and gravity, falling in a right line, will cause an elongation of the whole limb, in proportion to the loss of power in those parts which assist in attaching it to the pelvis.

But does the head of the femur become entirely displaced, as some authors have advanced; or, if it is not so, what becomes of it?

Before it has arrived at the edge of the acetabulum, the erosion of the inter-articular ligament,



and articulating cartilages has taken place. But the luxation does not take place, unless it is produced by a fall, or forcible movement of the thigh, sufficient for displacing the articular extremity of the femur, then deprived of its ligament, and of course easily displaced. It does not occur spontaneously, however. If on dissection of dead bodies, we find the head of the bone displaced posteriorly, we ought to refer the essential cause of it to a fall, or a violent percussion; the effects of which have been felt in the extremity of the bone, so as to produce a primitive or consecutive luxation. Femoro-coxalgia may either have preceded or followed this luxation. It is this which happened, I think, to the patients who were the subjects of the cases of Sabatier, my illustrious master.\*

When luxation exists at the same time with the disease of which I have been speaking, besides the symptoms peculiar to femoro-coxalgia, it exhibits those which characterize this luxation; but I have never met with an instance of this in the numerous patients which I have treated. But the internal erosive process is accompanied with a serous, lymphatic discharge, which fills at first the acetabulum, and concurs, without doubt, in

\* See the Memoirs of the Royal Academy of Surgery.

separating the head of the femur; the dimensions of which are reduced by the caries which attacks its surface. It spreads itself at the same time over the whole extent of the articular cavity, perforating the thinnest points; it extends itself by degrees into the os ilium, and penetrates the pelvis, when the fluid, before accumulated in the articulation, is suddenly poured out, and forms purulent sinuses. At other times, the fibres of the capsular ligament separate, and the fluid, infiltrating into the interstices of the neighbouring muscles, forms abscesses at points more or less distant from the source. At this moment, symptoms become more severe; the limb may even undergo a sudden shortening, owing to the caries of the head of the femur, or to the fluid escaping suddenly from the articular cavity, which characterizes the second stage. When this phenomenon occurs, it is often attributed to a spontaneous luxation, but if we examine attentively the conformation of the limb, we shall not find any signs which decidedly characterize this luxation. I repeat, except from mechanical causes, that the head of the femur, though reduced by the caries, does not become luxated; I have never seen a single instance of this, though I have had occasion to dissect a great number of persons who had died of femoro-coxalgia.

The third stage is characterized by the progress of the caries, the development of abscesses externally, at points more or less remote from the seat of the disease, and by a febrile and cachectical state of the patient. These abscesses, for the most part, are circumscribed, and present a uniform fluctuation at every point of their surface, without local pain, or change of colour in the skin; they increase slowly and insensibly, and, when they have gone to a certain extent, their walls become thin, and they finish by opening spontaneously. At this time, the patient falls into a state of slow and colliquative fever, the ulcerated parts become gangrenous, and the patient dies. On opening the body, purulent sinuses are found about the joint, and the bones destroyed by the caries.

Such is the progress of this disease, as I have observed it in a great number of individuals. When it has not passed the first or second stage, it is susceptible of cure, especially if the patient be removed from the action of the causes which have produced it. I have seen numerous examples of this, and there are many reported in my Campaigns. I am now about to make known others, not less interesting, at the end of this article. But if the disease has arrived at the third

stage, it is much more difficult to stop its progress and obtain a cure; nevertheless, we ought to try the use of the proper remedies. I will now make known these remedies, and their mode of application.

In the first stage, it is necessary to relieve the inflammation of the articulating parts by local, derivative bleeding; for example, cupping with scarification, applied repeatedly about the joint. By this operation, if made judiciously, we discharge, by degrees, the vessels of the articulating ligaments, the pain diminishes, and the patient experiences a manifest relief. If the inflammatory symptoms remain, or if they return in the course of the disease, as has happened in some of my patients, it will be proper to introduce a seton into the fold of the thigh, through the integuments, and cellular tissue, without touching the muscles, or any of the crural vessels or nerves. I employed this with advantage in one of the subjects of the following cases; the moxa produces afterwards the happiest effects. "*Quibus a diuturno coxendicis dolore femoris caput suo loco excidit, iis crur tabescit et claudicant, nisi urantur.*"\*

Doctor Corref, one of the learned professors of Berlin, had the goodness to inform me, in passing

\* Hippocrates, aphorism lx. section 6, Bosguillon's edition.

through Paris at the beginning of the year 1816, that Professor Rust, formerly of Vienna, but now a professor in the university of Berlin, used with great advantage, and without any preparation, the actual cautery; which he applied about the articulation in three oblique lines, uniting at the trochanter. M. Rust had a cautery made, the form and thickness of which were such, that it preserved a sufficient degree of heat during its whole application, to produce the necessary degree of cauterisation, without there being any necessity of putting it into the fire. He had observed, immediately after the cauterisation, the limb suddenly restored to its natural length, and become level with the opposite. I have had occasion to verify this remarkable phenomenon in several patients, whose cases are related below, in whom this restoration took place, in the manner described by the German professor.

I think this phenomenon may be explained in the following manner: If the elongation of the limb arise from a rupture of the inter-articular ligament at one of its points of insertion, as well as a paralytic state of the surrounding muscles, as I have before described; the application of the actual cautery to the region of the joint, must have the effect of producing, at the moment, a simulta-

neous, and almost tetanic contraction of these muscles, and of restoring to the weakened ligaments an elasticity and reaction necessary to fix, temporarily, the head of the femur in the acetabulum; to which it returns suddenly by this artificial contraction. What confirms the above assertion, relative to the rupture of the inter-articular ligament is; if the patient, considering himself cured, because the limbs have become of equal length, exert himself in such a manner as to bring back to the muscles the rheumatic affection, and likewise that sort of paralysis which is the consequence of it; the limb will become again suddenly lengthened, and preserve this elongation for an indefinite period; unless the action of the muscles and the elasticity of the ligaments are re-established. These principles will be confirmed by one of the cases appended to this article. This sudden shortening, from the application of the actual cautery, proves beyond a doubt that there is no luxation.

But I have observed also, that when we confine ourselves to the employment of the metallic cautery, the elongation of the limb gradually returns, and that those symptoms of the disease, which had for a moment ceased, soon return. We may prevent their return, however, by the repeated appli-



cation of moxa, and cure the disease by persevering in its use.

Shall we say then that the application of the metallic cautery is necessary or useless? Without undertaking to decide upon this question, which experience alone can definitely determine, and however frightful it may be, I think it concurs powerfully in assisting the action of the moxa; which, from its not acting with the same energy, does not stop so promptly the progress of the disease.

The moxas should be applied about the joint, either one or even two at a time, if the strength and courage of the patient will permit. It is necessary to allow an interval of one or more days between the applications, according to the effects produced or the state of the atmosphere. Foggy, humid, and cold weather, are less suitable than that which is dry and serene.

*First Stage.* In the first period of the disease, it is easy to conceive how the means I have already pointed out may arrest its progress, and re-establish the vital properties in the parts affected. Cupping, by unloading the engorged vessels of the fibrous and osseous parts of the joint, favours the circulation of the fluids in these vessels, and restores the suspended functions in the lymphatics.



The effects of the irritation and inflammation become gradually assuaged.

Hippocrates knew very well the happy effects arising from the employment of cupping in this, which he called the hip disease; as is proved in the following passage of his work: "*De locis in homine:*" "*Quum coxendicum morbus a fluxione fiat, cucurbitam medicam affligere oportet,*" &c. Besides, the advantages of cupping will be shewn more in detail, in an article specially devoted to this subject.

The combustion of the moxa produced by the blow pipe, is to be preferred to that which takes place spontaneously, without the aid of blowing; because, in this last case, the column of air which is made to pass forcibly through the capillary tube of the pipe, conducts, or transmits to a proportional depth, the caloric disengaged during combustion, together with a considerable portion of oxygen. It is to the excitation which this double principle produces deeply upon the diseased parts, to which the efficacy of the remedy is attributable. Besides, the moxas at each application take away the internal irritation, and the mass of caloric which they communicate to the deeper seated parts, increase their re-action, and restore them to their primitive state.

*Second Stage.* If the caries has commenced, and there is a purulent collection, the effects of the moxa are less prompt and efficacious. However, they often succeed, instances of which have come under my own observation; this should encourage practitioners to use them, and persevere in their employment.

This second stage of the disease is characterized, as I have before observed, by a great elongation of the limb, difficulty in moving it or even absolute immobility, extreme emaciation of the patient, and slow fever. Frequently, the above mentioned causes may occasion a more or less palpable shortening of the limb. The part about the joint is painful to the touch, and swelled at the most depending points, where there may sometimes be distinguished a fluctuation, and incipient depositions, at various distances from the joint. In these cases, cupping is less indicated; it is necessary to hasten the application of the moxa. The actual cautery should not be employed but with the greatest precaution, so as not to break the walls of the abscess, if it is near the joint; because its opening will establish a communication between the purulent sac and the external air, from which will result troublesome symptoms, especially if the caries be not stopped, as I have

before observed. The violent, but gradual excitement, which the moxas communicate to the diseased parts, stops the morbid process, and appears to augment the action of the absorbents; so that the fluids, accumulated in the abscesses about the joint or distant from it, if they be not too much distended, are absorbed and thrown into the circulation. I am ignorant of the parts through which the absorption of this matter is effected; but I am inclined to think that it is through the cellular tissue and venous system. In all these cases, it is announced by the diminution of the tumour, and a pustular eruption\* which takes place over the whole surface of the individual, as well as the earthy and purulent sediment of the urine, which is constantly precipitated during rest to the bottom of the vessel.†

The caries, or ulceration of the bone, may be cicatrised, yet, like an ulcer of the soft parts, leave a depression proportioned to the loss of substance, and the expansion, or development of the osseous vessels which go from the edges of the carious bone towards its centre, to produce cica-

\* We know that a cutaneous eruption, resembling flea-bites, marks often the termination of rheumatism.

† We read in the Memoirs of the Royal Academy of Sciences, the case of a young person who was completely cured of an abscess after ten days, of fever, and several purulent stools.

trisation. If the caries has attacked the boney pieces which are in contact with the joint, the limb will remain shortened, with deformity and lameness.

Whatever may be the effects of femoro-coxalgia, it is very seldom that an ankylosis of the bones composing this joint takes place; these bones preserve always a motion more or less free, which is favoured by the polish that they acquire at their points of contact; for the articular cartilages, when once destroyed, are never reproduced; in a word, these surfaces become completely solidified, the ligamentous parts which have remained sound, become thickened, and the disease is cured.

*Third Stage.* When the caries is very extensive, and the consecutive abscesses are large, and near the source of the disease, art presents but few resources. However, I have known some examples of cure when the disease has arrived at this stage; and it is our duty, in all cases, to try the means advised in the second stage. But we ought not to determine to open the abscesses until we are convinced that we have no reason to hope that resolution will take place, and the source of the matter which composes them be dried up; which will imply that the caries is stopped. We

shall know this by the cessation of the local pain, by its absence when the affected limb is moved, by the returning nutrition, strength, and plumpness of the patient, and, especially, when the abscess, though it does not increase in size, is about to open spontaneously.

If at this period we are so happy as to arrive at this result, by the reiterated application of moxas, the use of antiscorbutics, and tonics taken internally, which supposes at least six or eight months treatment; we may then try the operation suitable to these sort of abscesses, in the manner described in my Campaigns,\* and which I have retraced in the course of this article. The operation being performed in this manner, we must apply upon the external wall of the abscess, after it has been entirely evacuated, thick compresses soaked in camphorated oil of chamomile, heated, and kept in its place by a slightly compressive bandage.

I think this method preferable to that used at present, which consists in making a puncture at the most depending part of the tumour, by means of a trocar, and allowing the matter contained in the abscess to escape gradually. By this method of opening the abscess, the external air produces a rapid change in the matter remaining at the

\* Page 599, vol. ii.

source of the disease, the parts are seized with a gangrenous affection, and death shortly follows. But by my process, I diminish the internal source of infection and contagion, by evacuating, by means of dry cupping, the whole of the fluid contained in the sac. The walls of the abscess become agglutinated together, and may more readily contract a mutual adhesion; in a word, nature, assisted by all these means, acts with more success against the morbid causes.

During the dressings, which it is necessary frequently to renew, we should take care to keep the walls of the sac constantly together, so as to prevent the introduction of air into the wound.

As far as I have observed, the scrophulous femoro-coxalgia of children does not present any sensible difference in the symptoms from that we have described. In them, as in adults attacked with rheumatic femoro-coxalgia, luxation of the femur does not take place, except from some mechanical cause, acting in the course of the disease. I have had occasion to treat many children affected with this complaint, and my remarks on this subject are similar to those made upon soldiers. I have noticed, however, that the progress of the disease is more prompt, and that its termination is more rapidly fatal. Internal remedies, as anti-



scorbutic and anti-scorphulous medicines, will not stop its progress; but the moxa, applied in the manner prescribed, produces astonishing effects, and constantly removes the disease when it is not too far advanced. I could cite many examples to support this assertion.

I will add to these reflections, that the actual cautery, justly extolled by the German professor in the rheumatic femoro-coxalgia of adults, does not appear to me to be adapted to the scrophulous coxalgia of very young patients. It is to be expected that this severe cautery will produce a much greater destruction, as the soft parts of these individuals are in a much more mucous state, from age and disease, and we may produce, by this method, a putrid local affection. We should, therefore, limit ourselves to the application of small moxas, made with the prescribed precautions, and the use of anti-scorbutics, which will assist the effects of these topical remedies.

In support of the principles established in this article, as they relate to the rheumatic femoro-coxalgia of adults, I will now relate a series of cases which appear to me to possess considerable interest.

*Case 1st.* Mademoiselle de St. M—, aged twenty-one years, possessed of extreme sensibility, had been tormented for a long time with violent



pains in the left iliac region, towards the coxo-femoral articulation, and in the knee of the same side; they were accompanied with a singular neuralgia, the cause of which was not recognized by several physicians of Paris.

Doctor Corref, the person already mentioned, requested me to be called in when this young lady was in an alarming situation, from a tetanic constriction of the pharynx and œsophagus, which had been combatted without success. We were compelled to force a passage into the stomach by means of an œsophageal sound. Afterwards, we applied cupping with scarification, the nervous and inflammatory symptoms were entirely dissipated by the third day.

We then turned our attention to the cause of the various nervous symptoms which the patient frequently experienced, when we discovered a hereditary, rheumatic femoro-coxalgia, with symptoms which indicated the disease to be in the second stage. There presented itself above the crural arch, and below the anterior spine of the os ilium, an ovoid tumour, projecting a little, at the bottom of which there was an evident fluctuation.

The inflammation which existed, however, yielded readily to the application of cupping with

scarification; after which we applied the moxa. The first seven or eight applications produced an extremely favourable change. We opposed the violent pains, which continued, by passing a seton through the integuments under the crest of the ilium, which was kept there for fifteen days. New moxas were applied at various points about the joint; by the thirteenth application, the tumour had entirely disappeared. There was a considerable purulent discharge from the uterus in this case, varying with the state of the atmosphere.

The diseased extremity, which was at first about four centimetres longer than the other, was considerably retracted; and, although partly bent, it was shortened about two centimetres. The cure was completed after the application of twenty moxas.

How can we account then for the progress, and surprisingly happy termination of this disease? It is, undoubtedly difficult, nevertheless, I think that by applying to this case the principles which I have established, hypothetically, in the course of this article, we shall be convinced, not only that there was absorption of the purulent matter collected in the abscess which had already formed in the pelvis behind the acetabulum, but that the caries had perforated the bone. This I observed in a

subject who had died of the disease in the military hospital of Gros-Caillou, and who probably would have recovered his health; if, like Made-moiselle de St. M——, and many other patients, he had rigorously observed the regimen which was prescribed to him. But, at the moment when there was every reason to expect a cure, this patient gave himself up to every sort of intemperance, and even to onanism, of which he could not break himself, and he sunk. On opening the body, we found the cartilage of the acetabulum destroyed, the circumference and bottom of this cavity carious, though we could perceive upon its external surface, marks of cicatrisation, similar to what is observed in the cicatrisation of soft parts. The head of the femur had also lost its cartilage and round ligament, and this eminence was reduced to one third of its volume by the caries, to which had succeeded a true cicatrisation. The traces of a considerable abscess were also observed in the interior of the pelvis, with thickening of portions of the periosteum corresponding to the seat of the disease. This specimen of morbid anatomy, which I have preserved, has been presented to the Society of Medicine of the Faculty of Paris.

A similar piece has been presented to the same society by Messrs. Beclard and Cloquet. It was

taken from the body of a man about forty years of age, in whom the vertebral column was also changed in a similar manner. These two lesions constituted in him a femoro-coxalgia, and rachialgia.\*

But inasmuch as nature, assisted by art, had arrested the progress of the disease when arrived at the third degree, and effected a cure in this patient; *a fortiori*, are we not authorised to believe it to have occurred in the case of Mademoiselle de St. M——? In her indeed the disease was much less advanced, but was more complicated by the different symptoms which it produced, or which accompanied it. In this young lady, there was also a shortening of the limb, from caries of the boney parts which composed the joint, internal cicatrization and re-establishment, in a great measure, of the movements of the extremity, and of all its functions. This lady, with a slight lameness, enjoys now good health.

*Case 2nd.* A grenadier of the cavalry, about twenty-two years of age, entered the hospital of Gros-Caillou, in December, 1814, presenting all the signs of a femoro-coxalgia of the right thigh, with an abscess by congestion established on the outer and anterior part of the ilio-femoral articu-

\* See Bulletin of the Society, No. 7, 1816.

lation of that side. The tumour projected about three centimetres, and was about five or six long. The diseased extremity, which could with difficulty execute the slightest motions, fell short of the level of the other about three centimetres. Every thing announced a spontaneous luxation, except the characteristic signs of which I have spoken, and which I have not met in any of these patients.

The repeated application of cupping with scarification preceded the moxas, which, until the fifth, did not give any hope of producing a resolution of the tumour. But after the eighth and ninth, it was reduced to a quarter of its size. New moxas caused it to diminish, more and more, when, being obliged to go away, I entrusted this patient to the care of Doctor Pigon; who, by continuing the same treatment, cured him, leaving scarcely any deformity or lameness, inasmuch as this limb was but a few millimetres shorter than that of the opposite side.

*Case 3rd.* In October, 1814, I saw another femoro-coxalgia in the second stage, in the person of M. de Ronsan, (Jean Cassimer,) aged about thirty-two years, of the body-guard of the king. This disease was the consequence of a rheumatic

affection, which had been produced by cold and wet bivouacs.

The diseased limb was about four centimetres longer than the opposite, and in a state of atrophy, with almost complete immobility. There was, in the region of the nates, an ovoid tumour, in the centre of which there was an obscure fluctuation. Other symptoms appeared to announce a spontaneous luxation of the femur, produced in such a manner that the head of the bone seemed to rest on one of the external points of the edge of the acetabulum; but no pathognomonic signs of luxation confirmed this suspicion.

It is scarcely necessary to repeat that, guided by the principles above laid down in describing femoro-coxalgia, I applied cupping about the joint. Some moxas had already diminished the disease, when Professor Rust, passing through Paris, on his way to Berlin, advised me to apply the actual cautery about the region of the joint, as a suitable means of at once restoring the limb to its natural length. It was necessary to see and perform myself this operation, before I could believe in the result.

Three deep lines, converging at their inferior part, were traced with the actual cautery on the posterior region of the joint. Immediately after



this cauterisation, to my great surprise, the limb lost its unnatural length. After fifteen days of ease, the pains in the knee returned, and the limb became again elongated a centimetre and a half; though the cauterisation had been sufficiently deep, and according to the views of the German professor. The application of moxas, to which I thought it best to return, and which I continued to the number of twenty-one, removed the pains and the elongation, and restored the motions of the limb. In February, 1816, the cure of this soldier was perfect, the limb being only a centimetre shorter than the other.

*Case 4th.* We meet more frequently with femoro-coxalgia in the cavalry and artillery, who, being more accustomed to bivouacs, are of consequence more exposed to rheumatic affections.

Dubois (Jacques,) aged twenty-five years, entered the hospital of Gros-Caillou in February, 1816. Violent and permanent pains in the right knee, flexion of the leg, difficulty of moving, tumefaction about the ilio-femoral articulation, slow continued fever, emaciation, an ovoid tumour with obscure and deep fluctuation towards the inside of the joint, or towards the external and posterior part, according to the attitude of the patient, were



sufficient to announce the existence of femoro-coxalgia.

The limb was about three centimetres longer than the other; when left to itself, it immediately returned to its former position. At the first appearance, one would have affirmed that spontaneous luxation was on the point of being completely effected; my prognostic was the reverse.

After cupping, four moxas quieted the pains; but the tumefaction of the thigh, and its elongation, remained nearly the same. I decided, as in the preceding case, to employ the actual cautery, according to the method of Professor Rust. The result of this application was equally happy and prompt; the diseased limb became about three centimetres shorter. However, in a few days it began to lengthen again; the moxas, which I pushed to the number of twenty-five, prevented the elongation and completed the cure of the limb, which remained only a centimetre and a half shorter than the other.

*Case 5th.* Malo, (Jean Claude,) aged about twenty-three years, cuirassier in the first regiment of the royal guard, in June, 1816, exhibited to us a femoro-coxalgia in the second stage, arising from a rheumatic affection, contracted in the cold and humid bivouacs of Saxony. The symptoms, which

characterized the disease, seemed also to announce a true displacement of the head of the femur, forced from its socket towards one of the external points of the edge of this cavity; so that several surgeons could not be persuaded to the contrary, until they saw me perform the operation of Professor Rust, which was again attended with the same success. The limb lost about three centimetres of its length. Of course, this was preceded by the application of cupping with scarification, and a suitable regimen.

My experience in the two preceding cases, of the tendency of the diseased extremity to become elongated after the cauterisation, induced me to suspect that this would take place in the present instance. In fact, in fifteen days afterwards, this occurred, and I was obliged to apply fifteen moxas to obtain a permanent shortening of the limb.

Malo had become perfectly cured after three months treatment, when, in consequence of a long run, at his first going out, he was again suddenly attacked with new inflammatory symptoms, which reproduced in the first twenty-four hours, all the symptoms which had been remarked at the period of his first entrance into the hospital. In this relapse, it was evident that the inflammation of the

ligaments of the diseased joint produced these phenomena, since the frequent application of cupping with scarification was sufficient to remove them.

It is with good reason that the ancients recommended the most perfect repose in treating diseases of the joints. Though they may be apparently well, in consequence of the remedies employed, we should not suffer patients attacked with femoro-coxalgia, to walk before the entire restoration of the parts, the return of the elasticity and re-action of the ligaments, the cessation of the state of paralytic relaxation of the muscles which surround the joint, and, lastly, the cicatrization of the internal ulcerations, whether they exist upon the articular surfaces, or are seated in the fibrous system; this at least supposes a space of five or six months.

When the inflammatory symptoms resist the repeated and free use of cupping with scarification, it is necessary to pass a seton through the integuments and cellular tissue of the region nearest the articulation. There are even cases where general bleeding is indicated, though these cases are rare, and the seton may supply their place. The operation required for the seton is accompanied with an effusion of blood; this local

bleeding disgorges more and more, the inflamed vessels about the articulation. The irritation and suppuration produced by the seton, afterwards assist in the resolution of the abscess. Finally, we may consolidate the cure by the application of a new series of moxas. This is what I did for Malo, after having employed antiphlogistic remedies; the patient experienced remarkable relief. I insisted, nevertheless, upon the use of the moxa, until the cure was complete, which took place shortly after, when this soldier was returned fit for duty.

*Case 6th.* Raboullard, (Jaques,) aged twenty-one years, a soldier in the second regiment of the cuirassiers of the guard, had been thrown from the top of a carriage into a ditch; the wheel having passed over him, he remained for five hours plunged in ice, and lying on his right side. Violent pains suddenly seized upon the ilio-femoral articulation, the knee and lumbar region of the same side. In consequence of this accident, the right inferior extremity became elongated about a centimetre. The pains sometimes moderate, and at others severe, according to the circumstances in which the young man was placed, continued, however, steadily to increase. At the time the patient came to our hospital, in August, 1816, he

exhibited symptoms of a femoro-coxalgia, the elongation of the limb having considerably augmented.

Cupping glasses, applied methodically for fifteen days, unloaded the vessels, and produced a revulsive effect. I traced afterwards three rays with the actual cautery over the region of the coxa-femoral articulation, in the manner described above. Fifteen moxas confirmed the sudden shortening of the limb produced by the cauterisation.

*Case 7th.* Dunan, (Abraham,) a soldier in the sixth regiment of the royal guard, aged twenty-five years, of a lymphatico-sanguineous temperament, in consequence of the campaign of Waterloo, in the month of June, 1815, began to feel deep seated pains in the right coxo-femoral articulation, and the corresponding knee. These pains came on without any apparent cause, and were considered as rheumatic; they were less severe during the pleasant weather, and returned in cold wet weather, and whenever there was a sudden change of temperature. After remaining for forty days in the hospital, during the months of September and October, the disease was diminished. Dunan then believing himself to be cured, returned to his duty; but in the month of January the pains returned with increased severity, the limb became longer than the other, and the patient was obliged

to keep the leg in a state of circumduction, while walking. He felt also violent pains in the hip and knee. Notwithstanding the severity of these symptoms, it was not until the month of October, that there appeared in the middle part of the lumbar region, a soft tumour with fluctuation, without any change of colour in the skin.

Dunan returned to the hospital in the early part of December, presenting the following symptoms. There was upon the external region of the pelvis, answering to the superior part of the sacrum, a tumour about the size of the two fists, with fluctuation, but without any discolouration of the skin. It yielded to pressure, but then became perceptible at the upper part of the thigh, which was extended upon the pelvis, and could not be bent without giving the patient intense pain. The leg was slightly bent upon the thigh, and returned suddenly to a state of flexion, when the efforts for extension ceased; he was incapable of standing.

From these symptoms, I at once recognized an abscess by congestion, arising from a caries in the coxo-femoral articulation. Fourteen moxas were successively applied, the pains diminishing considerably after each application. After the fourteenth, the patient could bend the thigh upon the



pelvis, and extend the leg upon the thigh without experiencing much pain.

The opening of the abscess was made on the fifteenth of February, in the manner already described; there was discharged about a pint of serous pus, without odour, mixed with albuminous flocculi, and small osseous fragments, the remains of the caries of the head of the thigh bone. The first fifteen days which followed this operation, were passed without accident. At this period, the patient procured for himself aliments, and indulged himself to intemperance; the suppuration was dried up almost entirely, and its character changed; the wound only discharging a serous and very fetid matter; a malignant fever developed itself. These symptoms were opposed with success by the means indicated in such cases; the pus became of a better quality, and was discharged in a few drops at a time; the limb became shortened about one centimetre, and the patient could bend the thigh voluntarily, without feeling any pain. His flesh now returned daily, in a remarkable manner, and there was every appearance of an approaching cure, which was effectually accomplished by the end of July, under the influence of ten or twelve additional moxas. This soldier was returned to his regiment fit for duty.



I shall terminate this recital of cases of femorocoxalgia, with a summary of that of M. R —, who I treated in the city for a similar affection, on whom caustic, applied after the manner of Pott, (*i. e.* introducing peas into the eschar, opened over the great trochanter of the diseased side) had been employed without success.

This case shews the inefficacy of this method, as the malady had reached the third stage; that is to say, the limb had become elongated about two centimetres, and an abscess by congestion had taken place beneath the cauterised point; there was violent pain in this region, and through the whole limb, with slow and continued fever, &c.

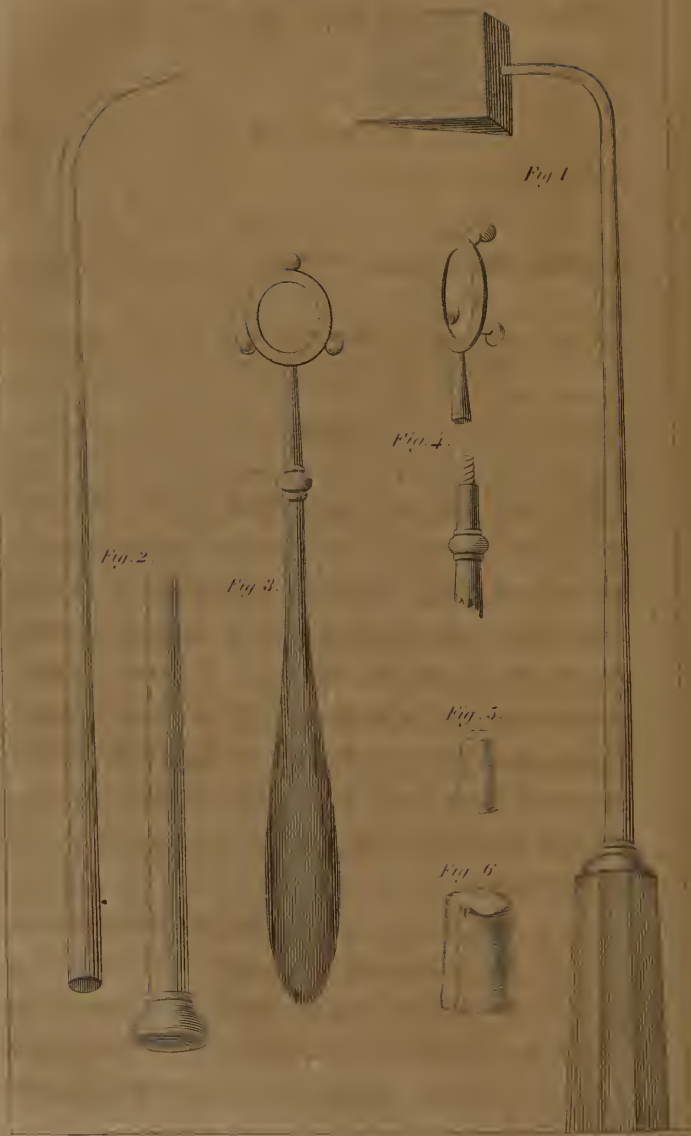
Thirty-two moxas, applied successively and with the precautions indicated above, induced an absorption of the matter contained in the abscess, and cicatrisation of the ulcerated and carious parts, as indicated by the shortening of the limb. In a word, the cure was so perfect that, with the exception of slight lameness, the patient walks with almost as much facility as before the attack of this disease. I performed this very fortunate cure in the course of the year 1818.

I have employed the moxa with the same success in lymphatic diseases of the other articulations of the limbs, especially in that called white

swelling of the knee. We assist very much the effects of the cautery, which should be sometimes preceded by a seton passed through the cellular tissue on the sides of the knee, by a uniform and gradual pressure made with linen straps covered with pure styrax, and placed carefully one over the other; this dressing should be left for five or six days at a time. I have remarked, in such cases, that the remains of the inter-articular cartilages, and the fluids accumulated in the joint, become absorbed; the tumefaction of the boney parts are gradually reduced; the ligaments acquire their natural consistency, a smooth substance is formed on the surface of the condyles, which replaces the cartilages; in a word, the cure is at length obtained, and the individual preserves at last the motions of the joint. This disease will constitute the subject of another essay, to which I shall immediately turn my attention.

Such are the diseases for which the moxa has appeared to me generally indicated, and which I have combatted with the greatest success. It is easy to conceive that this remedy may be suitable in other chronic affections; but I shall leave the task of determining them to other physicians.

# Moxa



## ESSAY II.

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### ON THE SEAT AND EFFECTS OF NOSTALGIA;

WITH SOME REFLECTIONS ON PARTIAL LESIONS OF THE BRAIN, RESULTING  
FROM SPONTANEOUS OR MECHANICAL CAUSES.

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**E**VERY thing proves, contrary to the opinion of some anatomists, that the brain, or encephalon, is the essential and exclusive instrument of all the sensations, either spontaneous, or impressed upon this organ by external agents. A great number of facts relating to lesions of the brain, and many dissections, have satisfied me of the truth of this assertion, long since established by very distinguished anatomists, as Haller, Sæmmering, and Doctor Gall.

We cannot doubt, in fact, that mental diseases, like all the passions of the mind, have their seat exclusively in the brain. But does nostalgia, which has given rise to so many hypotheses and different opinions respecting its seat and morbid

effects, establish itself in this organ; and does it really alter the integrity of its functions?

This is an important question which I will now endeavour to solve. I shall confine myself, for the present, to relating some facts relative to this disease, and to describing all the phenomena which accompany or characterize it, with the differences which exist, or may exist, between this morbid affection, and other diseases which have also their seat in the brain.

It is very evident that all the sensations are transmitted directly to this organ, either by the nervous system, with which it is immediately connected, or by the senses, the nerves of which establish also with it a direct and intimate relation. From this unquestionable truth, the brain must necessarily receive the first effects of these sensations, and, according to the greater or less active influence that these effects exert upon its pulpy substance, there will take place a proportional alteration in the internal organs, which receive, directly or indirectly, the vital properties of the encephalic nerves.

From this nervous correspondence an explanation may be readily given of certain pathological phenomena, which have heretofore escaped the eyes of observers.

Thus, the first effect of the ardent desire that the individual attacked with nostalgia experiences to see once more his native country, when he is unable to gratify it, must necessarily be followed by a painful inquietude, which progressively increases. This passion, resulting from sensations transmitted to the brain by the senses, appears to affect at first the circumference of the brain, where probably reside the organs of induction. The first pernicious effects of these moral impressions produce, undoubtedly, a sort of expansion in the substance of the brain, engorgement and torpor of the vessels of this organ, and successively, of the membranes which envelope it, and line its cavities; the first pathological phenomena, also, which are observed in these cases, are weakness or aberration of the intellectual functions. These effects afterwards propagate themselves gradually, towards the deep seated parts of the brain, which furnish the nerves of the organs of sense and locomotion; so that the functions of these organs also become weakened, or undergo changes which have their particular symptoms.

Wounds of the head, or any other external causes which injure the brain at any of the points of its periphery, or on its anterior or superior surface, produce analogous results. Hereafter, I

shall endeavour to develop these ideas, and to sustain them by cases.

In injuries of the head, which act eccentrically, from the interior towards the surface, such as are produced by mechanical causes, directed obliquely from the base of the cranium towards its interior part; in metastases, which act from a point more or less remote towards this same part; and in collections of fluid formed in the cerebral cavities, the alteration of the functions of the brain should present a different progress, and have different results. In these instances, the compression is exerted upon the origin of some, or all of the nerves of locomotion; upon those of the mixt organs; and of the senses, the functions of which may be disordered or weakened in a proportionate degree, while the intellectual faculties remain partly or entirely sound; for it may be said of these faculties, as of the organs of sense, that they may and do act separately.

I will not recapitulate the phenomena or symptoms that solutions of continuity on the surface of the cranium, with penetration, whatever may be their nature, may produce upon the brain. These are described in numerous treatises, or in published cases of wounds of the head.



Thus, for example, it is well known that when a foreign body compresses the brain at some points of its superior surface, the mental functions are more or less sensibly affected; and that if it be in the power of art to relieve this compression, by allowing the extravasated fluid to escape, or by extracting the body which exerts it, the intellectual faculties return in the same proportion. I have had frequent occasions to verify these phenomena in the numerous wounds of the head, which I have dressed, both in armies and in hospitals. Without stopping at this sort of wounds, I shall first give some account of the facts which I have observed in a great number of persons affected with nostalgia during their lives, and after their deaths. In these, as in the greater number of insane persons, the mental faculties become altered at first; and those of the life of relation present, successively, the same phenomena. All persons affected with nostalgia experience, indeed, mental aberration; such, for example, are the delightful and enchanting pictures they present to themselves of the place of their birth, while at a distance from it, however rude and barren it may be; their expecting to see their relations and friends advancing to meet them, clothed in rich dresses, and with the most affectionate greetings. At first there is an

exaltation; this is characterized by a spontaneous augmentation of the temperature of the head, increase of the pulse, irregular movements of the individual, redness of the conjunctiva, looking in various directions, and rapid and incoherent utterance. To these succeed oppression, sighing, constipation, and wandering pains in different parts of the body.

To this state of pyrexia, succeed compression and torpor of all the organs; the stomach and diaphragm, being no longer stimulated as in health, by the pneumo-gastric nerves, fall into a state of torpor, and there appear symptoms of gastritis, or gastro-enteritis, which are, for the most part, consecutive symptoms of lesion of the brain. The digestive functions are deranged, the fever becomes more severe, and proceeds with the ordinary consequences.

In the third stage, an asthenic state occurs, with prostration of strength; melancholy seizes upon the patient; he groans and weeps; often he has a horror of aliments, and sometimes of transparent fluids, as water, when the disease assumes the character of hydrophobia. At last, life becomes a burden, and the patient gives himself up to death without reluctance, if the hand which should execute it be not already paralyzed; or the vital

powers become gradually extinguished, and he dies insensible.

During the retreat of Moscow, we saw a great number of our companions in whom the brain was thus affected by a temperature of from twenty-five to ninety degrees of Far.

On examining the bodies of persons dying of nostalgia we find. *First.* The surface of the hemispheres of the brain in a state of deep inflammation, with suppurating points, the seat and extent of which vary; the arachnoides, and pia mater participate in this inflammation. The substance of the brain is softened, and the arteries gorged with black and fluid blood. *Second.* The lungs are also engorged, and the cavities of the heart very much dilated and filled with black coagulated blood. *Third.* The stomach and intestines are distended with flatus and their mucous membranes injected, but do not present signs of a true inflammation. These individuals, therefore, do not die, as is generally supposed, of a gastro-enteritis, but in consequence of the morbid changes which take place in the brain.

The inhabitants of cold and moist climates, as Holland; or mountainous regions, as Switzerland and Brisgau, are very susceptible of the moral impressions which produce nostalgia; a remark

which has been already made by many celebrated physicians. The troops of these nations, in consequence of this moral susceptibility, suffered most from the cruel vicissitudes to which we were exposed, during the campaign of Moscow.\* While upon the burning soil of the old world, whatever may have been said by other writers who have never seen that country, I did not observe a single individual in the army, who exhibited the slightest symptom of nostalgia. On the contrary, all received so just and favourable an idea of Egypt, that they considered it as a second home; there are few of our companions who have not sincerely regretted this climate.

Many persons belonging to the Royal Swiss Guard, have been sent to the hospital to be treated for diseases not possessing any determinate character, but which speedily exhibited the signs of nostalgia. This was particularly noticed during the year 1820, and more especially at times when the barometer stood very high. Under these circumstances, also, all cases of mental alienation become exasperated, of which I have seen the most unequivocal proof. The first and most remarkable of these patients, was a soldier in the first Swiss regiment. He entered at first the fever

\* See the fourth volume of my General Description.

ward, but his situation presented nothing in its appearance alarming to Doctor Cornac, who prescribed every thing that was required.

One day I was informed, during my visit, that this unfortunate man had committed suicide in his bed, a short time after the doctor had left him. I ran immediately to his assistance, and found him bathed in blood, and almost expiring of a large wound which he had made in the region of the heart, with a kind of knife called *enstache*. The wound was situated immediately beneath the left breast; it was directed, obliquely, from behind forwards, about three inches in extent, following the direction of the interval between the sixth and seventh ribs. The muscles were divided, and the instrument had penetrated into the chest through the space between the ribs. A large quantity of scarlet, frothy blood, had escaped, and still continued to be poured out from the wound. This induced me to suspect a deep injury of the lung, and even of the pericardium. The lips of the wounded man were discoloured, the eyes immovable, watery and half closed, the pulse nearly gone, the extremities cold, the voice lost, and the respiration scarcely perceptible. To my great surprise, I found at the edge of the wound seven different incisions, by which the part was cut into

small, irregular, and parallel slips, two or three lines wide. From this, it was evident that the patient had repeated his operation eight or nine times; undoubtedly reaching the lungs, until the muscular power had become too much weakened by the loss of blood, to repeat it. If the patients in the wards, and the overseers, had not heard the plaintive cry which he uttered after the last blow, and had not found the instrument strongly grasped in his right hand, the medical jurist would not have believed that the patient could have possessed the power of performing such an action.\* I shall endeavour to give some explanation of this phenomenon at the end of the case.

Notwithstanding the desperate state of the patient, I hastened to cut away the torn strips, and to simplify the wound as much as possible, in order to procure a union, and to intercept the passage of the external air. Although the result was unsuccessful, I nevertheless retarded the death of this patient, and so far restored him, as to induce me to conceive some hopes of his safety. The

\* While I was a pupil in the General Hospital of Thoulouse, I remember that a lunatic, having concealed a razor in the straw of his bed, made five or six incisions into his belly, almost in the same line, one of them having opened this cavity between two and three inches, through which almost all the bowels escaped. The patient died the sooner, as he tore the intestines.



development of the pulse, heat, motions, respiration, and colour of the lips, indicated a cessation of the hemorrhage, and the return of the vital powers. I prescribed embrocations of the warm camphorated oil of camomile, over the limbs and belly, and anti-spasmodic, mucilaginous drinks, and edulcorated emulsions. I applied ice to the head, and endeavoured to calm the mind of the patient, promising to procure permission for his return to his native country, if he desired it. But he paid no attention to this proposal, which his state of mental aberration did not allow him to appreciate. He was in so absolute a state of insensibility, that he did not manifest the least pain at the first dressing, and appeared to have abandoned himself to his fate. He displayed no desire for any thing; all the functions of the life of relation were considerably weakened, and those of internal life very much disturbed. He was, however, calm enough for several hours, and did not suffer any remarkable accident. But having torn away the dressing during the night, symptoms of traumatic inflammation supervened the following day, and he sunk rapidly; all the remedies indicated in such cases were unsuccessfully employed, and he died between the fifth and sixth days of the accident in great anguish.



The body was examined twenty-four hours after death; I found the wound had penetrated, as I before remarked, into the left cavity of the chest, between the sixth and seventh ribs. The blade of the instrument had at first pierced a portion of the lung; it had afterwards grazed the pericardium, and torn the left phrenic nerve. About two pounds of blood, mixed with serosity, had been extravasated into this cavity. All the serous membranes were inflamed, and covered with a thick albuminous substance, through which vessels were already developed to produce mutual adhesions. The lung was divided about an inch deep, and had become of the consistence of liver, (*hepatise*,) through the rest of its extent. The cavities of the heart were very much dilated, and filled with black and fluid blood. The left lung, and the viscera of the belly, were in a natural state.

The cranium being sawed and opened, I was astonished to find a layer of purulent albumen, covering the whole periphery of the brain, and that the arachnoides was implicated in the disease. Many suppurating points were also remarked in the cortical substance of this organ, especially towards the anterior lobes, and at the superior edges of the hemispheres. The sinuses of the dura mater, and all the vessels of the ence-

phalon, were engorged with black and carbonized blood. There was also a great quantity of serosity in the ventricles, but the base of the cerebrum and cerebellum were sound.

From these facts we may infer, that a cephalitis, developed gradually under the influence of a profound moral affection, occasioned in this Swiss by his ardent desire to return home, had preceded the attempt to commit suicide. I will now endeavour to explain this singular phenomenon.

I have already remarked that the cerebral sensibility of this patient was nearly extinguished at the time of his wound; for he did not manifest the least pain during the incisions which were made in removing the irregular strips into which the integuments had been cut, preparatory to dressing it, as was remarked above. If the sensibility had not been extinguished in this soldier, he would never have been able to repeat eight times this painful and difficult operation with a dull knife. But how can we account for the muscular power exerted by the hand in this case, when the sensibility of the patient was almost reduced to nothing, and the intellectual faculties in such a state of aberration and weakness, that he could only answer to the questions proposed to him in monosyllables, in a manner quite foreign to the subject?

This fact, and others analogous to it, which will be related in the course of this essay, appear to me to demonstrate that the nervous cords of animal sensibility, and those of loco-motion, have a distinct origin in the brain, or its prolongations; which seems to render probable the hypothesis proposed by me respecting the electrical telegraph of the celebrated Sæmmering, upon the nerves of animal life.\*

The secondary phenomenon presented by this young Swiss, before and after his wound, equally support the assertions of Doctor Gall concerning the seat of the organs which perform the intellectual functions. This celebrated anatomist places the seat of these organs in the circumvolutions which occupy the surface of the anterior and superior half of the hemispheres of the brain. The individuals attacked with the dropsy of the ventricles, or other spontaneous congestions, which exert an eccentric compression upon one or more points of the base of the cranium, so as to produce partial or general paralysis in the organs of loco-motion, without affecting those of the intellect, furnish also proofs in favour of this opinion. In support of these ideas, I will give a further ac-

\* See the bulletin of the Medical Society of Emulation, vol. iv,

count of my observations on patients treated under my own eyes.

Jean Humbert, a soldier in the fifth regiment of the infantry of the guard, entered the hospital in the month of August, 1820, for a slight contusion of the breast occasioned by a fall. He was scarcely well from this accident when he manifested a strong desire to return to his native country, one of the valleys of Franche Comte. In consequence of his convalescence, I advised him to return himself fit for duty immediately, promising at the same time to procure leave of absence for him; as soon as the return should be made to the minister of war. I prescribed for him at the same time a mild regimen and pediluvium. But notwithstanding all my exertions, symptoms of nostalgia suddenly presented themselves and became developed with extreme rapidity. The barometer had risen at this time to twenty-eight inches and some lines.

The first symptoms which manifested themselves in this young soldier were signs of mental derangement and pains of the head. He spoke but little, his ideas were incoherent, and he passed nearly the whole night in a state of somnambulism. Except the cephalalgia, of which he spoke at first, he complained of no pain; he carried

his hand. however, habitually to his forehead, and was constantly in a state of restlessness and insomnia. His extremities were always cold and his pulse slow and irregular; unnatural heat was felt about the vertex; the vessels of the conjunctiva were injected; the look wandering, and the eyes watery. He did not eat, and felt a great repugnance to use limpid drinks, such as pure water, but drank with pleasure bitter and coloured ptisans.

To this state of excitement, soon succeeded a sort of general collapse; the locomotive powers became progressively weakened, so that the patient could not rise from his bed; the sensitive functions lost also their activity in the same proportion; and the patient at last fell into a lethargic state; he would not answer to any questions that were proposed to him, in a word, his physical sensibility was reduced to almost nothing. I employed, at first, but few curative means; but, seeing the disease assume an alarming character, I determined to open the jugular vein, and afterwards the temporal artery. I applied sinapisms to the feet, and ice to the head, and both dry and moist cupping to the hypochondria and belly; mucilaginous and antispasmodic drinks, emollient, anodyne enemata, and camphorated oily embroca-

tions were successively prescribed. These remedies were followed by a temporary calm; but the cerebral affection developed itself anew, and made such rapid progress, that the stimulus exerted by the pneumo-gastric nerves upon the stomach, lungs, and no doubt, heart, was almost annihilated. The functions also of these organs were essentially altered, by a sort of paralytic affection or torpor, which induced an engorgement of their membranes, and all the symptoms peculiar to a phlegmasia of these viscera.

Such, for the most part, is the origin of the pulmonary angina, gastritis and enteritis, which develop themselves, with more or less facility, according to circumstances, but are, in fact, the result of the disease of the brain. But to return to my subject—the patient fell into a state of complete ataxia, and died without any appearance of pain, on the evening of the ninth day of the attack.

The dissection, which was made twenty-four hours after death, discovered to me, as in the subject of the first case, the whole intestinal tube considerably distended by flatus; the mucous membranes of the stomach and intestines injected; the liver was a brown colour, considerably engorged, and projecting beyond the edge of the ribs.

On opening the cranium and vertebral canal, I discovered an albuminous covering spread over the whole periphery of the hemispheres of the brain; it had taken place between the dura mater and pia mater. Points of a yellowish supuration penetrated, rather deeply, into the anterior lobes of this organ, and a considerable quantity of yellowish serosity filled the lateral ventricles. The substance of the encephalon was thickened, and the spinal membranes inflamed.

A third patient, who died of the same disease, at the same time, in one of the fever wards, presented the same phenomena, both before and after his death.

The subject of the following case exhibited, during his disease and after his death, some remarkable peculiarities. This man was called D——; he was a soldier in one of the regiments of the Royal Guard, twenty-three years of age, and born in the department of the North, on the frontiers of Belgium. He had a fair complexion, and a lymphatic constitution, and entered into the wounded ward of the hospital of Gros-Caillou, towards the end of the month of February last, on account of pains in the left shoulder, accompanied with a dull pain and numbness in the corres-



ponding arm. He manifested great repugnance to the life of a soldier, and expressed among his comrades a desire to return to his native country. To these symptoms were added every mark of exhaustion of the physical and moral powers; the melancholy result of onanism in which this young man, by his own acknowledgment, had unreservedly indulged himself. I directed the successive application of humid cupping about the parts affected, together with several Chinese moxas, which calmed the pains, and restored the motions of the arm. At length this soldier, considering himself cured, left the hospital and returned to his regiment. Nevertheless, I took the precaution to recommend him to the surgeon-major, as well on account of the moral affection, as for the disease for which he entered the hospital, which was not entirely removed.

He remained for some days in this situation, but a new disease declared itself, and on the first of the following April, he was re-conducted to the hospital, and placed in the fever ward. He presented all the symptoms of a febrile, cerebral affection; although he had lost the use of his reason, and almost all the sensitive faculties, he exhibited unequivocal signs of nostalgia; for dur-

ing the delirium with which he was attacked, he spoke incessantly of his country.\*

Rubefacients were applied to the feet and legs, and all the means usually employed in such cases, were had recourse to. To the slight delirium which at first manifested itself, succeeded stupor, which increased until it terminated in death; all the animal and sensitive functions were rapidly destroyed, and the patient fell into a state of complete prostration. The limbs were seized with paralysis, his hands crossed upon the abdomen, and his eyes closed. Such was his situation when I was invited to see him in the fever ward; it was then the sixth day of the disease. Questions, slight blows, and agitation, could not rouse him from his lethargy. When the eye-lids were separated with the fingers, the eyes were immovable, dull, and without expression; the pupils were dilated; the rays of the sun, as well as light frictions applied about the eye-lids, did not produce any motion. Being desirous of ascertaining the state of the animal sensibility, which I supposed to be nearly extinguished, I applied lighted matches

\* We are ignorant of the determining causes of this last attack; but it is not improbable that the patient might have endeavoured to dissipate his chagrin and debility by means of spirituous liquors, which all soldiers use, especially at Paris.

of flax to different parts of the body. These applications did not produce any sensation in D—, nor could I perceive the slightest motion in any of the burnt parts; the pulsations of the heart and arteries, which were vermicular and scarcely perceptible, did not undergo the slightest change.

With the intention of producing a vivid excitement in the solar plexus, I made use of dry cupping about the epigastrium. To my great surprise it produced, simultaneously, motions in the superior eye-lids, contraction in the iris, and circumduction of the globe of the eyes. I caused these motions to be executed at pleasure, after several intervals, by the same means. I was convinced, however, that the consciousness of the patient did not remain, that he could not appreciate any of these sensations, and was incapable of seeing; as he did not exhibit the least sign of pain on the application of the moxa, or the cupping glasses, which were quite warm, from the spirit which had been burnt in them. The same application, when made to the limbs, did not produce any apparent phenomenon; though, when again applied to the epigastrium, it determined a sensible contraction, especially in the iris. This state

remained even after death, for, on examining the body, the pupils were still contracted.

Finally, after having passed some time in an existence purely vegetative, and a state of almost complete annihilation, the last remnant of vitality, which had retreated to the organs of internal life, was exhaled; the patient died on the seventh day of the attack of the disease. Thirty-six hours after death, I proceeded to the dissection of the body, commencing at the abdominal cavity. I found in the abdomen the serous coat of the small intestines, especially the ilium, in a state of chronic inflammatory engorgement. There were remarked small whitish granulations, and points of adhesion between the intestinal convolutions. The mucous membrane of the digestive canal was white, through its whole extent; the bladder was filled with urine of a deep red colour; the liver and spleen were gorged with black fluid blood.

The lungs were sound, but the pleura adhered by membranous bands of old formation. The heart and its dependencies were in a natural state.

When the cranium was removed, it appeared to me to present an extraordinary and unnatural excavation, relatively to the proportions of the subject. The sutures, and the ridges which are

generally observed, were entirely obliterated, and the bone of this part, as through the whole cavity of the skull, was very thin. The dura mater did not present any remarkable pathological appearance; but, after having cut and removed it, I found the arachnoides inflamed, and spotted over with purulent, albuminous plates, some of which extended through the pia mater to the brain. They existed especially upon the internal edges of the hemispheres, and over the whole superior surface of the anterior lobes of the brain. A purulent abscess was formed at the base of the left lobe of the cerebellum, which was one-sixth part larger than the right. A large quantity of serosity filled the lateral ventricles, and extended itself even into the vertebral canal. The whole mass of the cerebrum was in a state of expansion and density, much more than is generally observed in inflammations of this organ. The expansion of the encephalon was carried to such an extent at its periphery, that it projected into all the cavities of the cranium, while at the upper parts of this bony case it was depressed. Thus, for example, the anterior extremities of the two hemispheres were flattened and depressed over the eminences formed by the orbit, so as to present a cavity of a depth and form proportioned to these

boney eminences; while the internal edges of these two lobes buried themselves in the two small ethmoidal cavities separated by the crista galli.

This dissection furnishes incontestible proof, that in nostalgia, as well as in all the other gloomy affections of the mind, as I have already asserted in the course of this essay, there is a true eccentric expansion, resulting from the erectility of its substance; occasioned by onanism, and generally by all causes of excitement.\* It is not without some reason that persons attacked with this disease, say that their skull is ready to burst.

I think I have saved many persons attacked with nostalgia by employing the means indicated above, and administered with modifications adapted to the constitutions of the subjects, and the period of their disease, &c. Continued exercise, and particularly the immediate departure of the patient for their own country, have contributed much to their cure. A professor of Montpelier, Vigorous, cured all the English who went to consult him for the *spleen*, by advising them to make long and uninterrupted journeys on foot, or horseback,

\* We observe a similar phenomenon in *herniæ cerebri*, which sometimes occur after the operation of trepan. The first may be called *spontaneous, acute cerebritis*; the second *accidental cerebritis*. This affection is analogous to enteritis which occurs in the portion of intestine strangulated in hernia.

or by post, according to the wealth of the patient. He sometimes joined to this some innocent drinks, differently coloured, which he prescribed as very valuable remedies. Journeys to mineral waters, in picturesque situations, were recommended by the physicians of antiquity, as at the present day, to dissipate melancholy, and prevent nostalgia.

Lymphatic idiosyncrasy, which has been already mentioned; residing in a cold and humid climate, to which the person is unaccustomed; slavery, or imprisonment,\* idleness, venery and onanism, are the general causes of nostalgia, and all the other kinds of melancholic vesaniæ; the effects of which concentrate themselves, especially in the brain. The periods at which the barometer rises suddenly, have appeared to me the most favourable to the development of these diseases. To prevent this sort of cerebral affection in soldiers who have lately joined their corps, it is necessary not to suffer those individuals who are predisposed to it, more repose than is necessary to recruit their strength, exhausted during the day; to vary their occupations, and to turn their labours and recrea-

\* It is, especially, in prisons that nostalgia and so many other affections of the mind take their origin. All the prisoners should be accustomed, as is practised in the United States, to some sort of labour, for which they should be compensated. It would have the double advantage of improving their morals, and preventing a most pernicious idleness.



tions to their own advantage, as well as to that of society. Thus, after the accustomed military exercises, it is desirable that they should be subjected to regular hours, gymnastic amusements, and some mode of useful instruction. It is in this manner, especially, that mutual instruction, established among the troops of the line, is beneficial to the soldier and the state. Warlike music, during their repasts, or at their hours of recreation, will contribute much to elevate the spirits of the soldier, and to keep away those gloomy reflections which frequently produce the effects which have been traced above.

It is by these precautions, and by the application of these principles of hygiene, that I had the happiness to preserve from nostalgia, and every other serious complaint, the crew of our frigate in the tedious cruise we made in the North Sea, in 1787 and 1788, since, of this company, we did not lose but one man, in consequence of a shipwreck.\* It belongs to the paternal solicitude of the chiefs of corps, enlightened by their surgeon majors, whose duty it is to execute the measures above indicated, to prevent nostalgia, a disease as dangerous as it is insidious. In a word, if these authorities do not put

\* See the first volume of my Campaigns.

in requisition the talents and experience of physicians to prevent the attack of these affections, it is the duty of the last to neglect nothing to stop their progress, when they do appear, to dissipate their effects, and to conduct the patient to a cure.

With this intention, and in case the nostalgia has declared itself in an individual, I will now describe, methodically, the mode of treatment which has appeared to me to be the best, with the effects I have obtained from it.

In the first period, which is that of pyrexia, it is necessary to unload the vessels of the head by direct and derivative bleeding; to condense gradually the fluids of this part by ablutions of cold water, or ice applied to the vertex, according to circumstances; to induce a derivation towards the lower parts, and to favour the development of the functions of the organs of internal life, by means of *semicupium*, at the temperature of from about twenty-five to twenty-six degrees of Reaumer; cupping glasses, applied to the hypochondriac, epigastric, and dorsal regions, and followed by camphorated, oily embrocations; joined with diluting and antispasmodic drinks. Gymnastic amusements, music, and constant exercise should not be neglected.

When the disease has reached the second stage, which is that of collapse, it becomes necessary to sustain the strength of the patient by light stomachics. We should apply dry frictions over the whole body; moxas, or slight cauteries about the base of the cranium, and, successively, rubefacients over the head and epigastrium. The patient should be put upon the use of warm infusions of cinchona, cascarilla, and cinnamon. The climate should always be changed as soon as possible, leaving cold and humid, for warm, airy situations, and countries inhabited by free people.

In the third stage, art can do but little, we can only look to nature to produce a salutary crisis. We ought, however, during the whole course of this dangerous malady, to treat our patient with great mildness and kindness.

To sustain these precepts, and to render them more intelligible, I will now give a summary of the cases of some patients that I have treated with success.

The first named Jean Barbier, aged twenty-five years, belonging to the first regiment of the cuirassiers of the royal guard, after having received a slight contusion upon the head, exhibited all the symptoms of nostalgia, a few days after his entrance into the hospital. It was in the

midst of the month of January last, when the barometer had risen suddenly from twenty-seven inches, two lines, to twenty-eight inches and some lines. The desire that this soldier had felt, for a long time, to return to his native country, as I have since learned from his comrades, joined to the blow he had received upon his head, may be considered as the occasional causes of the disease. The symptoms increased rapidly, and the patient was in danger for several days; however, they became insensibly diminished under the treatment I have already marked out, and in less than three weeks he was well, and returned to his duty; he did not even wish to use the convalescence that I allowed him. Bleeding from the jugular vein, cupping upon the back, ice about the head, and some moxas to the sides of the neck, appeared to me to be the remedies which produced the cure in this case.

The second was Barbet, (Theophile) aged twenty-three years, who was sent to the hospital on the eighth of January, of the same year, for a fall he had had a few days before. On the day after his entrance, he exhibited signs of nostalgia. His comrades informed me that this young soldier had been running all night from one ward to another, talking constantly of his country and his relations.

In fact, I discovered in this patient all the symptoms of an incipient cerebral affection, accompanied with mental aberration, and disorder in the sensitive functions. Otherwise, the muscular actions and digestive functions were not weakened. I did but little during the first two or three days; I was persuaded that he would do well; but accidents increased the disease, and this young soldier, after having spent a part of the night in running over several of the wards, at length scaled the garden wall and disappeared. He was endeavouring to find the road to his native place, when he was met by some soldiers of his regiment, and brought back to the hospital on the fifteenth of January, at the hour of my visit.

He was restless and agitated; an unnatural heat manifested itself about the head, the eyes were injected; the pulse was vibratory, and gave scarcely fifty pulsations in a minute. He only answered to the questions put to him in monosyllables, which had but little connexion with the question. He did not manifest any desire for food or drink, nor complain of any pain. He suffered himself to be bled from the jugular vein, which I immediately prescribed, without exhibiting the slightest evidence of pain. I afterwards directed the immediate application of cupping to the re-

gions above indicated, and to the head, while the patient was placed in a semicupium heated to twenty-five degrees of Reaumer, and afterwards allowed to take chicken soup, and cooling mucilaginous drinks.

All the symptoms soon diminished under the influence of this mode of treatment, and I considered his convalescence sufficiently established to send him home upon a furlough, which I expected daily to receive; when in the night of the twenty-first of the same month, the barometer having then risen to twenty-eight inches, eight lines, new symptoms supervened, and, for the second time, after having walked several times through the hospital, with signs of somnambulism, he again scaled the garden wall and took to flight. I have since learned that this soldier reached home, where he will probably get well.

I had long since remarked, in a great number of persons, that lesions, or alterations of those parts of the brain which are connected with the base of this organ, or the ventricles, were followed by weakness or loss of the sensitive faculties, in the organs of locomotion, and a very great difficulty in the functions of respiration, while the intellectual faculties remain untouched.



Dropsies of the ventricles of the brain, in different degrees, deep abscesses, or extravasations into the cranium, towards the base of this organ, produce these results. Instances of this kind may be found in the history of my Campaigns. I shall limit myself, therefore, to relating some interesting facts, which undoubtedly confirm the truth of these assertions.

I will begin with that of a young soldier in the sixty-first regiment of the line, by the name of Cros, whose head was traversed from the forehead to the occiput, by a ramrod shot at a distance of two paces, by one of his comrades, while playing together. The wounded man was not deprived of his understanding, but preserved, until the moment when he was trepaned, his intellectual faculties. The ramrod had passed over the median line of the base of the cranium, under the right hemisphere of the brain, without having broken in upon it; so that the superficies of this organ remained untouched.\*

I relate in the fourth volume of the same work, page 207, a case, not less remarkable, of a young grenadier of the ex-guard, named Barbin, who survived a similar wound. This soldier marched

\* See the third volume of my Campaigns, and the cranium of this patient deposited in the Anatomical Museum of the School of Medicine.



with the army to Moscow; in one of the combats that his corps had to sustain, he was trown to the ground, when he received, from the lance of a Cossac, a wound on the back part of the head, towards the centre of the lamdoidal suture. The weapon penetrated into the posterior lobe of the left hemisphere of the brain two inches and a half deep, undoubtedly, as far as the *centrum ovale* of Vieussens. The wounded man was left for dead upon the field of battle; but he was taken up some hours after, and carried to the neighbouring city, where he received all the assistance that his situation required. He passed through a series of extremely severe symptoms, as I have described in the case as related in the volume referred to above; nevertheless, he was restored to life and cured, and afterwards returned to France. When I presented this soldier at the School of Medicine, and the Societe Philomatique, he exhibited, at the point indicated, a cicatrix ten lines deep, and from fifteen to eighteen in length, with a total loss of voice, a paralytic affection of the superior extremities, of the larynx, pharynx, œsophagus, and stomach, together with a remarkable weakness in the organ of vision. On the other hand the intellectual faculties, which were at first suspended, were executed with surprising precision, as this

man answered in writing, with propriety, to all the questions which were proposed to him.

This fact, in my opinion, is a still stronger proof that the organs of induction, as is asserted by Dr. Gall, reside in the periphery of the anterior and superior half of the brain, at such an elevation that the considerable effusion into the interior of this organ, which must necessarily have taken place at the instant the wound was received, could not reach it. This portion of the encephalon then remained sound, while the nerves of the spinal marrow, having been injured and compressed, instantly lost their properties of conducting the vital stimulus, and suffered the organs above mentioned to fall into a state of paralysis.

I will add to these two a summary of a third case of a wound of the head, which will also shew the insulated condition of some of the cerebral faculties, and the symptoms which characterize their lesions. The subject of this case is M. Derampan, (Edward) *ex-officer* of cavalry, who, in fencing, on the second of March, 1817, was wounded by a foil, at the middle part of the left canine region, near the *ala nasi*, in an oblique direction from below, upwards, and a little inwards, the point of the foil having been broken upon the breast piece. The instrument penetrated to about

the distance of three inches and a half, through the left nasal fossa; traversed, undoubtedly, the cribriform plate of the ethmoid bone, near the insertion of the falx of the *dura mater*; and appeared to enter obliquely, from before, backwards, to a depth of from eight to nine lines into the posterior and internal part of the left anterior lobe of the brain, so as to approach the anterior part of the *corpus callosum*.

At the moment of receiving the wound, a profuse hemorrhage occurred, and there was, probably, a sanguineous effusion into the interior of the cranium. In a moment afterwards, the patient fell into a state of syncope, and lost entirely his senses, which were restored in a very slow and imperfect manner, with some remarkable circumstances. The vision was restored in a few days in the right eye, but the left was deprived of it for more than a month. By degrees it was restored in both, but the patient was affected with *diplopie*. The sense of smell, after being entirely lost, developed itself anew in the right nostril, and the patient readily distinguished on this side the odour of alcoholic liquors from inodorous fluids; however, the perception of odours was much less active on the left side. The sense of taste was also altered, but in such a manner that the right half

of the tongue perceived sapid bodies very well, while the left was deprived of this faculty. This organ was drawn towards the left side, in opposition to the hemiplegia, which existed on the right; the commissure of the lips was also drawn to the left. The hearing, which was at first lost in the right ear, was afterwards restored. All the right side, struck with the paralysis, insensibly recovered, for the most part, its motions.

The remembrance of things having any analogy with proper names, was totally extinguished; while the recollection of images, and every thing which is susceptible of description remained perfect. Thus, for example, the patient had a perfect recollection of the person and features of M. Larrey, whose attentions he had frequently experienced for various diseases and wounds; he knew him perfectly well, he saw him constantly before his eyes, to use the expression of the patient, but yet he could never remember his name, so that he distinguished him by that of *M. Chose*. He had also forgotten the names of his relatives and friends. He could not recollect the names of the different pieces which compose a gun, though he could describe them accurately.

The mental aberration, which at first occurred in this officer, had ceased; but every thing which

related particularly to himself, to his military fortunes, threw him into a state of alienation and profound melancholy; at the same time the conversations which related to his family, relatives or friends, restored to him the full exercise of his intellectual faculties.

The subject of the following case, as respects the insulated state of the cerebral organs, and the distinctive character that a lesion of each of these organs may offer, presented the most singular anomalies, and curious phenomena.

Lecœur, a fusilier in the second regiment of the infantry of the royal guard, about twenty-two years of age, of a robust constitution, and of a very sprightly character; on the nineteenth of November, 1820, while fencing with one of his companions, was wounded severely in the right eye by the foil; the button of which was broken off in the meshes of his mask. The point of the remaining part of the weapon pierced the upper eye-lid, beneath the eye-brow, and at the inner side of the orbit, penetrated deeply into the cranium, passing obliquely from the right to the left, and from before backwards, in such a manner that the instrument appeared to me to have pierced the thin suture which unites the os planum of the ethmoid to the frontal bone towards the internal orbitar

foramen. Afterwards it appeared to me to have passed behind, or into the substance of the *falx*, the first fold of the *dura mater*, before the sella turcica, grazing unquestionably the inner side of the right optic nerve. Lastly, the point must have passed under the anterior lobe of the left hemisphere of the brain, which was necessarily injured.

In this course, the narrow blade of the foil must have torn many vessels, and caused immediately more or less extravasation, under the left hemisphere, towards the fissure of Silvius, into the anterior and corresponding fossa of the cranium, and perhaps further. The small wound in the fold of the eye-lid was surrounded with an ecchymosis, which extended itself over the whole orbital region. There was a tumefaction in both eye-lids. The man did not fall in consequence of the wound, nor did he even lose his intellectual faculties; but he was immediately seized with severe pains in the head, especially on that side of the forehead which was opposite to the wound; there was also a painful numbness over the whole right side of the body, accompanied with slight convulsive motions of the face. This soldier, who does not appear to have lost for a single instant his reason, was carried at first to the barracks, and was not



transported to the hospital of the guard until the following morning. I was at the time occupied in paying my visit, so that I was ready to administer to him that assistance which his alarming situation required.

The paralysis was already manifest over the whole right side of the patient, but the superior extremity especially was entirely deprived of motion, while the animal sensibility was preserved, and afterwards even increased. The apex of the tongue projected from the mouth, and was directed to the right side in an opposite direction to the hemiplegia. This circumstance induced me to believe that an extravasation of blood had extended itself to the most depending points of the cranium. I believe I have given the explanation of the cause of this difference, in an article in my *Memoirs and Campaigns*. The pulse was slow and full, not exceeding forty-five or forty-six pulsations in a minute; the respiration and deglutition were slow and difficult; he could scarcely articulate a few words; he could not make me comprehend what he said respecting the cause of his accident.

After having made the patient lie down, my first care was to lay open the small wound of the eye-lid, and to explore, as much as possible, its



whole extent. A stylet conducted with care to the bottom of this wound, enabled me to discover, at the middle point, and behind the internal wall of the orbit, a perforation which appeared to me to pass in the direction I have marked above towards the ethmoidal fossa of the cavity of the cranium. It was not consonant to my maxims in practice to penetrate into this opening; it was sufficient for me to know that it penetrated into the cranium, to establish my prognostic, and to direct me in the mode of treatment that this wound indicated.

After this trifling operation, I bled the patient freely from the right temporal artery, and applied repeated cuppings with scarifications, to the nape of the neck, between the shoulders, and to the hypochondriac regions. The feet and legs were covered with mustard cataplasms, sprinkled with very strong camphorated vinegar. A bladder full of pounded ice was applied to the head during the whole inflammatory period. The patient was put upon the use of cooling mucilaginous drinks and ice. In the evening the patient was bled freely from the arm; purgative enemata were administered, and an embrocation of camphorated oil was applied to the belly.

The night was very alarming, the patient being very much agitated; he complained constantly of violent pains in the head, and a disagreeable sense of weight, which obliged him to remain continually in the same position. At the least movement he experienced vertigo, and was threatened with syncope. He always pointed out the left side of the forehead as being the seat of the pain, while the wound occasioned him no inconvenience. The vision of the left eye was perfect, but that of the right had undergone a particular alteration which I shall make known hereafter. To these symptoms were joined a retention of urine, which compelled me to use the gum elastic catheter, for the four or five first days. At my visit on the twenty-third, the cephalalgia and symptoms of compression of the brain being very much augmented, I took a large bleeding from the left jugular vein; cupping with scarification was again applied to the nape of the neck and between the shoulders; and the application of ice upon the head and mustard cataplasms to the legs, were continued. I insisted also upon the use of diluent laxatives, and I prescribed an antispasmodic potion, with the addition of a large dose of acetate of ammonia, a remedy very much extolled of late against cerebral affections.

The paralysis of the organs of motion of the right side of the face, and of the arm, had arrived at the greatest degree; but the retention of urine ceased, and abundant alvine evacuations succeeded to an obstinate constipation, which had taken place during the first four or five days. I then substituted, for the diluent mucilaginous drinks, chicken broth. On the seventh day of the disease I replaced the ice with a large vesicatory, which covered the whole superior and lateral surface of the head. Repeated cuppings were also applied over the right hypochondrium and the region of the stomach, and I followed this application by embrocations of camphorated oil of chamomile.

On the ninth day the pains of the head became relieved, the vertigo disappeared, and the speech became more easy. The very imminent danger, in which the wounded man had been until that time, disappeared; the hemiplegia continued, but the intellectual faculties had remained steadily unaffected. The patient answered with propriety and precision to the questions which were proposed to him, and often joined in the conversation of his attendants, though not without considerable mechanical difficulty.

I have already observed that the vision of the right eye presented one remarkable peculiarity. The patient, in fact, could only see with this eye the perpendicular half of objects which were placed before him, that is in the axis of the pupil which received their visual cone. When they were removed from this axis towards the side of the nose, they became visible, so that the patient could see them entirely. If, on the contrary, they were removed outwards, towards the temple, the eye of the patient remaining still, the bodies also in succession, entirely disappeared, although a part of the cone of rays, transmitted by the object, still penetrated through the pupil to the bottom of the eye; for this opening, as well as the membrane which formed it, had not undergone any alteration; its motions were performed with the same precision as those of the left eye.

This singular phenomenon, on account of which I presented the patient to the Society of the Faculty of Medicine, at the first meeting in February, seems to prove; First. That the retina is an expansion of the optic nerve, since the eye was not injured by the foil, which seems only to have touched the inner side of this nerve, at its passage into the cranium, before the sella tur-

cica.\* Second. That the different organs have not only distinct properties, but that these same organs may experience partial alterations in their functions. Third. It proves also, that the filaments which compose the nervous trunks in connexion with the encephalon, have a distinct origin, and receive from it a particular stimulus, relating to the functions over which these elementary filaments preside.†

Another phenomenon, not less remarkable, was presented in this individual. Notwithstanding the exactness of his reasonings and the just combinations of his ideas, (for he still continued to play at cards with his comrades and to beat them) he had entirely lost the faculty of recalling the names of things. He could not tell me the names of any of his relatives or friends; he had even forgotten his own first name, and, though he saw me daily, he could never recollect mine. I had before observed this peculiar anomaly in the aberration of the mental faculties in several wounded persons, especially in the subject of the preceding case. It would be curious to know if the ulcer which was found in the brain of the celebrated Brous-

\* It was afterwards ascertained that instead of the trunk of this nerve, it was its root that was injured by the point of the foil.

† See the bulletin of the Medical Society above mentioned.

sonnet, who had also lost the faculty of remembering the names of persons and things, towards the end of his career; had its seat in the same portion of this organ, as the lesion that I suppose must have existed in Lecœur and M. Derampan. I leave to doctor Gall, and the other physicians who dissected the body of this celebrated physician, to draw the proper physiological inferences.

By the nineteenth day the patient was relieved, and I had conceived the greatest hopes of a cure. Three vesicatories, which I applied successively to the head, appeared to me to produce excellent effects. To these applications, I added several moxas behind the ear of the same side, and over the course of the principal branches of the fascial nerve of the paralyzed side. The pains of the head and other symptoms of cerebral affection entirely disappeared, and the functions returned in the same proportion. I allowed him to use light food and water, reddened with good wine. Notwithstanding this perceptible improvement in his situation, the soldier grieved to see himself deprived of his leg and arm, though I had taken every means in my power to encourage him. At the first application of the moxa over the anterior cervical pair of nerves of the paralyzed side, strong contractions took place in the leg and arm,



which I could make return at pleasure, under the influence of this cautery. This phenomenon caused great surprise to the assistants, and caused the patient to weep with joy. The motions of the leg returned promptly, so that this soldier could walk on the thirty-first day, with assistance. The functions of the muscles of the face were also restored gradually. The movements of the arms returned more slowly; however, I hoped to re-establish them entirely, by continuing the same topical excitants.

The wounded man moved very well, and began to walk in the court of the hospital, and even in the city; afterwards he went on foot to present himself at the meeting of the Society of Medicine, on the eighth of February last. The internal functions were in other respects perfectly well, when he was suddenly seized with diabetes, characterized by the abundance of the urine, its transparency, sweet taste, inextinguishable thirst, and suppressed cutaneous transpiration. The analysis of this urine, made by doctor Duponchel, apothecary to the hospital, proved that there existed in this fluid, a large quantity of saccharine matter. I think that this new symptom, which again debilitated the patient, was produced, in a great degree, by the *spiritus Mindereri* that I had ad-

ministered in an appropriate potion, to the extent of several drams at a dose. I followed, in this respect, the opinion of the physicians, who recommend it in very large doses; now there is not a more powerful diurectic; and there can be no doubt that this substance irritated excessively the kidneys and the mucous membranes of all the digestive viscera. This example justifies the opinion of the ancients, who advised that this remedy should only be administered in small doses, a scruple at most. It proves also, as I have had occasion to remark in another case, that the immediate cause of diabetes consists essentially in a sort of phlegmasia of the kidneys and the viscera, which have some degree of sympathetic connexion with them. According to these ideas, as I transmitted them to my old friend and colleague, M. Lafond Gowzy, of Toulouse, in a letter written in January, 1820, I was anxious to prescribe for the patient cooling mucilaginous drinks, dry frictions over the whole body, and the application of dry and humid cupping over the lumbar region; and I would have successively applied the moxa over these regions, if the malady had not yielded to the employment of the first means.

On the seventh day, all the symptoms of diabetes disappeared entirely; the cupping seemed to

me to be particularly the most efficacious means. The patient was again restored to an encouraging state; he ate, drank, and slept well. I waited the return of fine weather to apply new moxas over the superior extremity; the motions of which were still executed very imperfectly, though the sensibility of this limb was, on the contrary, exalted. At last this paralytic affection, already very much ameliorated, gradually approached a cure; to which M. Henot, one of our most distinguished assistant surgeons, who was particularly charged with the care of this patient, very much contributed, by his zeal and assiduity.

This soldier waited with impatience his convalescent discharge, which I had promised him, so that he might return home, where he was extremely anxious to go; when on Monday, the eighteenth of February, he was informed by a letter from his brother, which some one had the imprudence to send to him, that a woman, with whom he had been intimately connected, had kept a considerable sum that his brother had sent to him, to enable him to return. This news produced so strong an impression, that he suffered a severe indigestion in consequence of a repast he had just made. He was seized with pain in the head, cholic, and repeated vomiting; he lost his

speech, and all the animal and sensitive functions, and fell into a state of stupor and general torpor, accompanied with chills, slight convulsive motions in the inferior extremities, which were seized, twenty-four hours afterwards, with an icy coldness, which artificial heat could not dissipate. At my visit on Monday morning, I found the patient in the state I have just described. I hastened to cover the whole of the superior surface of the head with a large vesicating powder of cantharides and camphor, in equal parts; I prescribed cooling enemata, some antispasmodic medicines, and the application of warm flannels over the whole surface of the body. The disease, however, made rapid progress, and the paralysis seized all the organs of sense and locomotion. There was an involuntary discharge of feces and urine, and it may be said that the whole life of relation was extinct by Tuesday, the twentieth; for all the other functions were completely annihilated, though the pulsation of the heart and arteries continued. The functions of internal life, although very weak, remained until the night of the twenty-first of February, when this interesting patient expired. This was the third month after the accident.

*Dissection.*—I commenced by opening the cranium; it discovered to me first, all the vessels of

the *dura mater* engorged with black and fluid blood. This being taken away, I discovered upon the superior surface of the encephalon a thin albuminous layer, confounded with the arachnoides. At the inner side of the mammary process of the os frontis, and very near to the ethmoidal *fossette*, I observed a transverse opening about three lines in length and one in diameter, with a separation of one of the laminæ of the internal table of the bone, upon which I found a thin layer of the cortical substance of the brain, that adhered to the edge of this opening. The corresponding point of the encephalon, presented a cavity answering to the cortical portion detached; from this cavity originated a canal, which passed superficially on the internal margin of the upper part of the right hemisphere of the brain, to a level with the concave edge of the falx, passing above the olfactory nerve of the same side. It passed the furrow which separates the two hemispheres, and penetrated into the left to about a depth of two lines. In passing over the left optic nerve, and the root of that of the right, the latter was injured by the point of the instrument, near its origin, and below the anterior cerebral artery; which was denuded at this point, and considerably dilated. The point of the foil at last stopped at the inferior wall of the lateral ventricle, very near

the left arm of the medulla oblongata. This oblique canal, which might be from two inches and a half to three inches long, was lined with a coat of coagulated blood. There was no trace of suppuration; there was only a little serosity of a reddish tint under the two lobes of the left hemisphere of the brain. This fluid had extended itself deeply under the cerebellum, and into the vertebral canal.

The organs of the chest, and the glandular viscera of the abdominal cavity, such as the liver, kidneys and pancreas, offered nothing that was remarkable. The stomach presented no morbid appearance, but the jejunum had three intussusceptions, to an extent of from two to three or four inches. These intussusceptions were recent and without inflammation. I found, nevertheless, the ilium inflamed in all its tunics. The large intestines were loaded, through their whole extent, with masses of hardened stercoraceous matter.

This dissection fully justified the prognostic I had made on the nature and depth of the lesion of the brain. It furnished a new proof in support of the assertion I had made respecting the seat and effects of profound, moral impressions, as nostalgia; which had seized upon the patient during the last days of his treatment for the wound. It

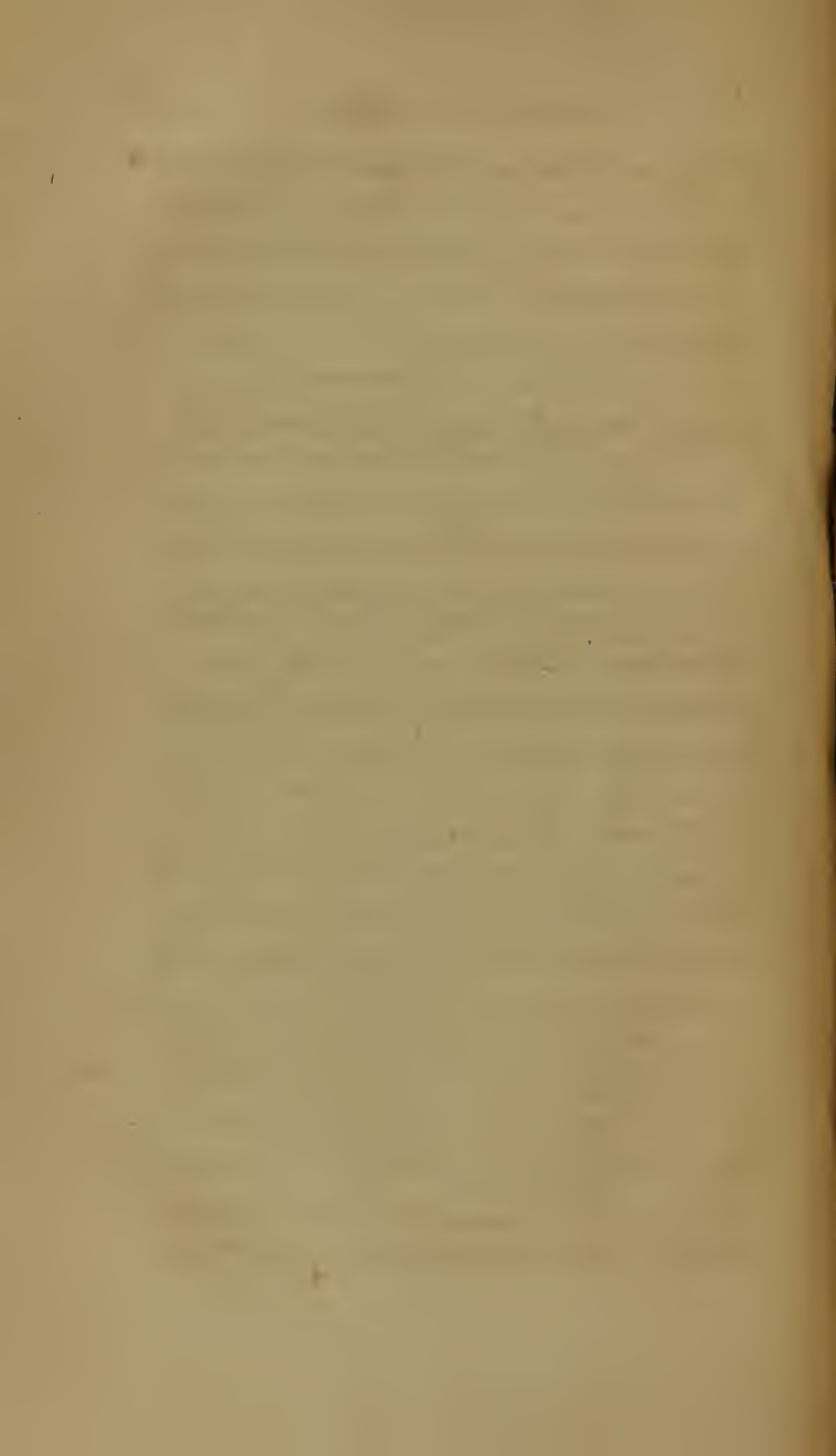


demonstrated at least the possibility of curing wounds of the brain, which have been heretofore considered mortal. It is evident, that the wound of Leeœur may be considered as cured, as the serosity found effused under the left hemisphere, and even under the cerebellum, was no doubt accumulated in these places at the time when all the vital forces of the patient were destroyed. It is certain, that the blood, which had at first occupied this space, was entirely absorbed; what proves this, is the distance this soldier went on foot from the hospital of Gros Caillou to the School of Medicine, and from this place to the hospital, without having experienced the slightest aberration of the mental faculties. Lastly, it is incontestible, that the causes of his death must be referred to the superficial alteration of the brain, induced by the moral affection (*nostalgia*) of the patient; to this he was predisposed, undoubtedly, by the effects of the wound and the invagination of the intestines, the consequence of the immoderate use the patient made of drinks of every kind, that he procured clandestinely from the other patients. Might not the intussusceptions have also the effect of causing the paralytic affection, which, towards the termination of the case, had seized the superior portions of the digestive

organs, to which the brain undoubtedly sends its stimulus by the pneumogastric nerves; while those of the organs of internal life, or the ganglionic nerves, having been irritated by the acrid matter detained in the lower part of these viscera, may have determined in these portions an anti-peristaltic motion; as the invaginations, as I have before remarked, seemed to have been formed from the lower extremity of the jejunum towards the upper?

Lastly, this case, as well as the preceding, which appear to me to be extremely interesting, should induce practitioners not to neglect any thing in similar cases, since they demonstrate clearly that both deep and superficial lesions of the brain are susceptible of cure.

*Note.* If the patient dies immediately after an acute inflammation of the brain, its substance will be found to have acquired density, and to be in a state of expansion proportioned to the degree of inflammation. If, on the contrary, the inflammation has become chronic, the brain, after having undergone an expansion, falls into a soft state, a consecutive effect of the disease or the death of the parts.



### ESSAY III.

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#### REMARKS ON THE PROPERTIES OF THE IRIS.\*

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I HAVE generally observed that the irritation or alterations carried on in the system of nerves of organic life have, directly or indirectly, an influence, more or less evident, upon those of the life of relation. But lesions established exclusively in the nerves of the life of relation have none, or nearly no influence upon the integrity of the functions of the nerves, or organs of internal life; or these effects, if they are manifested, are infinitely more slow than in the first case.

In support of this general opinion, I will now examine the comparative influence which the diseases of one of these nervous systems produce upon the other, and *vice versa*. This I conceive

\* A summary of the following remarks was read at the Societe Philomatique in 1817. See the bulletin of this Society, vol. iii. p. 134.

to be an important undertaking, and one which constitutes the subject of a great question in physiology and pathology. But before entering upon this question, I will first examine what is the sympathetic relation which exists between the iris and the retina or optic nerve?

Until of late, it has been generally acknowledged, that the contractile and retractile property of the iris arises from the nervous influence of the optic nerve, or retina. The greater number of the partisans of this opinion also advise not to perform the operation for cataract, especially extraction, when the iris is deprived of motion; because they suppose in this case that the visual organ is also paralysed. But since it has been found by experience that, in certain cases, the visual functions are restored after the depression or extraction of the cataract, though the iris was before immoveable, it has been supposed that this membranous partition could only contract when the retina received that impression which it requires in order that this contraction may take place. I shall endeavour first to demonstrate the error of this assertion, and afterwards to shew, as clearly as I can, that the contractile property of the iris is independent of the nervous influence of the retina or optic nerve.

I am now convinced, by my researches, and the cases that I have collected, that the properties of the iris depend especially upon its peculiar tissue, and the ciliary nerves, furnished principally by the lenticular ganglion belonging to the great sympathetic. This arrangement shews the nature of the paralytic affection of this membrane, when it exists, and the reasons why it does not take place when the optic nerves are paralyzed, or altered by any disease whatever. Thus, I have seen patients attacked with *gutta serena*, while the iris preserved its motions. The little English boy, whose sight I had the good fortune to restore in Spain, after the campaign of Corunna, was an example of this. This case of *gutta serena* is inserted in the third volume of my Campaigns, page 239, and is cited in the preceding Essay on Moxa.

In fully formed cataract, the retina may preserve its integrity, so as to be ready to resume its functions, when it shall be placed in a situation to receive the image of objects by the extraction or depression of the opaque veil which intercepts the passage of the luminous rays, though the iris be paralyzed; because this last affection depends upon the lesion of a system of nerves which belong to internal life, and which have with the life of



relation but indirect communications, by means of small nervous anastomoses. I would wish, however, not to be understood to include adhesions contracted by the iris, which may be confounded with paralysis of this membranous partition. I have witnessed many facts which go to support this opinion, and which prove that the immobility of the iris does not contra-indicate the operation of cataract.

The retina and iris may also be simultaneously or separately affected, according to the nature or manner of acting of those causes which produce the alteration. One of these causes, as remarkable as rare, is the direct impression upon the tissue of these membranes by the rays of the sun, received under certain circumstances. A great number of individuals were subjected to the influence of this cause, on the day of the late eclipse of the sun.\*

Two soldiers of the royal guard presented themselves at the hospital of Gros-Caillou, to be treated for serious accidents produced by that eclipse.

The first was named Jacquemort, (Jean Baptiste) *brigadier* in the train of artillery; being but little acquainted with the manner of observing this

\* Seventh of September, 1820.

phenomenon, he used an opaque glass, having a transparent point in the centre of it, which he had made himself for the purpose of better observing this celestial phenomenon. Notwithstanding the vivid, inconvenient, and very painful impression which he experienced from the passage of the solar rays through the lucid portion of the glass, he continued to look until the end of the eclipse. Soon after, he perceived the effects of it; he was seized with vertigo, a severe pain over the whole right side of the head, corresponding to the eye which he had used, and was nearly deprived of the sight of this eye; the iris, and other parts of the organ, remained uninjured. Some weeks afterwards, this soldier, continuing to experience constant acute pains in the head, presented himself at the hospital, and put himself under my care. At his arrival, on the seventh of November, 1820, the vessels of the eye were injected, and the pupil a little more contracted than that of the left; but it preserved its motions, though the vision was very obscure, indeed nearly lost.

In this instance, we see that a very small cone of rays had fallen directly upon the retina, and that its irritating effect had been propagated to the optic nerve, and even to its origin in the interior of the brain. After two bleedings from

the temporal artery and jugular vein, I employed cupping with scarification to the temple and nape of the neck. I passed afterwards to the employment of ice upon the head, and moxas, which re-established completely the visual functions; but the patient continued to feel a dull pain on the right side of the head.

The second, named Paintiaux, (Jean Baptiste,) a soldier in the fifth regiment of infantry, entered the hospital at the time when the first was discharged. He had observed the eclipse with the left eye, and had used a glass, the centre of which was opaque, and the circumference transparent. He was less incommoded than the first, because the solar rays were not directed upon the pupil, through which but few passed; but the circumference of the lucid cornea, and especially the ocular conjunctiva, had received a very vivid impression from the rays, which caused such an idiopathic inflammation, that the vessels of this membrane were injected to the centre of the cornea, over a great part of the surface of which, a slight whitish opacity developed itself. Suitable remedies diminished the symptoms, but the pupil was considerably retracted, and the iris had lost its motions, while the retina had preserved its visual functions. These pathological facts prove

evidently: First. That the properties of this first membrane, are independent of the retina. Second. That the ocular conjunctiva extends itself over the transparent cornea, covering it entirely; but that its tissue at this point is infinitely more delicate, and that the colouring part of the blood does not pass into its vessels, except in a violent inflammation of the conjunctiva.

I will now relate some cases which shew the relations of the properties of the iris with cataract.

A lad, aged about fourteen years, a gunsmith, in 1818, received a smart blow, by accident, from a ramrod, on the middle part of the lower edge of the left orbit. This blow was immediately followed by loss of sight in the eye of the same side, while the iris perfectly preserved its motions. The patient remained in this state from ten to eleven months. However, as he apprehended the loss of the other eye, the vision of which appeared to grow weaker, he came to consult me. After having attentively examined it, I subjected him to the following treatment:—Cupping with scarification was applied to the left temple, to the neck, nape of the neck, and between the shoulders. After a slight vomit, he was put upon the use of bitters, and I commenced the application of moxa. I placed the first on the left side, approaching as

near as possible to the origin of the optic nerves; a second was applied between the left angle of the maxilla and the mastoid process, over the course of the trunk of the facial nerve of the same side; four or five other small ones were successively placed over the corresponding temporal region. After the application of the first moxas, the patient received the impression of light, and was soon able to distinguish objects; this faculty developed itself progressively, and the vision of that side became as perfect as that of the right eye. The motions of the iris had continued to be performed with as much precision as in a healthy state of the organ; it was this circumstance which became the principal subject of my reflections.

This young man considered himself perfectly cured for several months; in fact, he saw with both eyes equally well. After this time, the vision of the left eye became sensibly obscured, and soon after lost it altogether. Alarmed at this new accident, he again came to claim my assistance. I at once found that a perfect cataract was formed in the crystalline lens, which intercepted in this eye the passage of the luminous rays, and produced complete blindness. I at the same time remarked that the iris had preserved its motions, and was in a perfect state of integrity. There

were two remarkable circumstances in this case; the first was the paralysis of the retina, and the loss of vision, while the iris did not undergo the least alteration; the second was the rapid formation of the cataract. The first proves, in the most unquestionable manner, that the properties of the iris are independent of the retina; the second, that the crystalline lens does not nourish itself by imbibition, but by a vascular circulation like the other parts of living organized bodies; for, if the very delicate vessels of the crystalline lens had not been ruptured where they pass from the capsule to the lens, it would not have lost its transparency so rapidly.\* Besides, the movements of the pupil of this side, were always in perfect harmony with those of the iris of the right eye.

In tetanus, when all the muscles excited by the nerves of animal life are in a state of permanent contraction, the iris is not changed in its properties; it is observed, that the alternate contraction and enlargement of the pupil, are executed the same as in health. In certain diseases of the brain, as dropsy of the ventricles, the same phe-

\* Sæmmering injected these vessels even to the capsule of the lens, but as they do not admit the colouring part of the blood beyond this capsule, it has been improperly concluded that the crystalline nourishes itself by imbibition.



nomena are observed. The sensitive functions are considerably weakened or paralyzed, by the concentric or eccentric compression that the nerves of the organs of sense (the optic nerves for example) experience at their origin, by the dilatation of the ventricles, while the iris remains uninjured and preserves its movements. They may be even sympathetically increased, by irritating the system of organs of internal life, by means of drastic purges or emetics.\* An English lady, affected by this disease, two children, which I have also treated in the city, and a grenadier in the horse guard, who was under my care in the hospital of Gros Caillou, have furnished striking examples of this. There can be no doubt that this grenadier was attacked with a dropsy of the ventricles of the brain, in consequence of falling violently upon the back of his head. At any rate, he presented all the symptoms which were gradually developed, and advanced to a very high degree. The principal symptoms were a dull pain, with a sense of heaviness in the head, a great weakness of all the senses, and of the speech, a sensible alteration of all the animal functions, except the intellect, which

\* In verminous diseases, the motions of the iris or pupil are accelerated, and sometimes convulsive; the vision, however, remaining unaffected, See also in the fourth case of the preceding memoir, the effects of excitants acting upon the nerves of internal life.

was natural; the right arm was seized with paralysis in the second degree, and the legs were weak and habitually cold. However, in this patient, whom I succeeded in curing, the iris preserved all its properties and motions. I remarked, that the pupil dilated in proportion to the activity of the drastic purges which were administered. I have made the same remark on a great number of patients with wounds of the head, attended with loss of sight, and a striking change in the organs of animal life.

The iris, for the same reasons, may lose its organic properties, while the optic nerve, retina, and other parts of the eye, preserve perfectly their integrity, and execute all their functions. A woman, thirty-four years of age, of a dark complexion, and of a constitution sound and robust, came to consult me in the course of the last winter, for an affection of this kind. The iris, in both eyes, was completely paralytic and dilated, so that the opening of the pupil could be made to contract to about a quarter of a line in diameter only, by means of the most powerful excitants, and by the impression of a sudden and vivid light. But, notwithstanding this very striking deformity, she perceived objects very readily, and distinguished,

even exactly, their figures and colours, provided they were not brought too near to the eyes.

I have since had occasion to see in several soldiers of the guard, this membrane entirely lose its motions by percussion on the edge of the orbit, or a punctured wound of the cornea, with lesion of the larger circumference of the iris, while the vision remained unaffected. But it should also be remarked, that the same mechanical causes may destroy the vital properties of both membranes, as we have seen in a *guard-du-corps*, and in a soldier of the royal guard; the patient was even discharged on account of this infirmity.

In organic affections of the viscera of internal life, such as chronic inflammations of the heart, pericardium, or some of the principal viscera of the abdomen, the opening of the iris gradually contracts to such a degree, that the pupil becomes sometimes completely closed, and does not permit the passage of the luminous rays. But the retina preserves the integrity of its visual properties, which may be restored by the operation for artificial pupil. Nevertheless, from these observations, it will be important to know, if the individual attacked could perceive objects, before the complete occlusion of the pupil, for in case of amaurosis the operation will be useless.

My remarks upon iritis go to shew, that, after having run through all its stages, this inflammation, which is ordinarily caused by repelled syphilis, has for its results, as has been judiciously observed by the Austrian Professor Beer; *First*, the discolouration of the anterior surface of the diseased membrane. *Second*, Ectropium, or the destruction of a part of the diameter of the opening of the pupil, and especially of its superior segment. I have never observed that the semi-circular cut, which is sometimes formed in the superior part of this membrane, ever takes place in its inferior portion. This latter part loses its motions, while the tattered remnant, (*le lambeau*) which has survived the destruction of the other part, preserves its movements more or less sensibly. I have often remarked this phenomenon; but it has never appeared to me to be more evident, than in a grenadier treated in my wards. It appears to depend upon the disposition of the ciliary nerves and vessels which are directed, principally, from the superior part to all the rest of this membrane.

An English navy officer of between twenty-seven and twenty-eight years of age, was suddenly attacked by a violent ophthalmia, with iritis. Slight ulcerations of the transparent cornea, with a pro-

digious turgescence of the ocular conjunctiva were manifested, and produced a true chemosis; this resulted from a metastasis, or repulsion of the syphilitic virus, from one or more chancres on the penis. This alarming disease; which was successfully combatted and overcome by the usual means, was followed by a discolouration and paralysis of the iris, the pupil continuing dilated, while the visual functions still remained. The chemosis was removed by excision around the whole circumference of the transparent cornea; but there still existed a considerable number of capillary vessels which traversed from one side to the other, which it was necessary to remove, to restore its transparency.\*

It is undoubtedly very difficult to determine the causes of the dilatation and contraction of the pupil and to explain its mechanism. But, as in man and most animals, these motions appear to be independent of the will of the individual, it may be presumed that the stimulus which produces

\* I think the conjunctiva is formed of two distinct parts; the first is the palpebral conjunctiva, which appears to participate in the properties of the mucous membranes; the second, the ocular conjunctiva, seems to partake of the serous. The first is the seat of ophthalmia from gonorrhœa and other catarrhs; the second becomes inflamed with other parts of the eye, from the influence of virus, or mechanical causes.

the contraction of the fibres of the iris is exclusively furnished by the nervous branches which arise from the opthalmic ganglion, belonging to the system of nerves of internal life. But we ought to remember: *First*. That this membranous curtain, in man, and many animals, receives directly one or two filaments from the nasal nerve, belonging to the first branch of the fifth cerebral pair. *Second*. That the motions of this partition appear to be modified, more or less perceptibly, in the same individuals; either under the influence of a very strong light, which irritates this membranous veil, or by the sudden appearance of images of an aspect more or less excitant, with respect to their colour or form. *Third*. That this partition appears really to execute its motions under the tacit influence of the will of the individual, but expressed by the repetition of the phenomenon, in certain birds, of the family of paroquets.\* From these reflections it may be conceived that the iris is a mixed organ, a por-

\* According to the celebrated Cuvier, the ray, or *thornback*, appears not only to possess the faculty of moving the pupil at will, like paroquets, but it also presents a prolongation at the superior edge of this opening, disposed in the form of a grated palm leaf, which this fish no doubt lets fall at will, before the crystalline lens, like a lattice. In the torpedæ this opaque membranous veil is entire, and this ray can cover the whole pupil at will. See the second volume of the Lectures on Comparative Anatomy.



tion of which, to a certain extent, and in particular species, is submissive to the control of the will of the individual, while another portion executes its motions without this participation.\*

From this structure, which I shall hereafter describe in a more detailed manner, and from the mode of distribution of the nerves sent to this membranous curtain, we may conclude then; that the relaxation of the iris or the dilatation of the pupil is produced by the folding up of the flexuous arteries, naturally arranged in a zig-zag or in spiral lines, and by the engorgement of these vessels, determined by the stimulus that the nervous filaments of the opthalmic ganglion transmits to this membrane. But the contraction of this moveable curtain, or closing up of the pupil, is undoubtedly produced by the engorgement of the small arterial or ciliary crown, which acts like the cord of a purse. This engorgement appears to be determined by the stimulus of the long ciliary nerves, which render themselves from the nasal nerve within the compass of this opening, without communicating with those of the lenticular ganglion. The irritations also of the stomach or lungs determine often the contraction of the pupil, while

\* We remark the same properties in the urinary bladder; the sphincter of which contracts by the stimulus of the nerves of animal life, while the body of this membranous sac is stimulated by those of internal life.

those of the intestines, uterus or bladder have appeared to me to cause a dilatation of this opening, as we often remark in children affected with verminous diseases.

Notwithstanding these two systems of nerves, the movements of the iris are certainly independent of the nervous influence of the retina; this will be evident from the following *exposé* of facts.

The camelion has no moveable iris in the interior of the eye; this is compensated for by the external eye-lid, which in this animal is of a peculiar form and structure. We find, however, behind the cornea a small pearl-like zone, covered with gilded striæ, almost imperceptible. This zone, of an extremely dense and compact texture, is confounded with the ciliary processes, and adheres to the circumference of the capsule of the crystalline, of which the anterior segment projects beyond the edges about one line. This pearl-like zone therefore does not appear to have any other use than that of refracting the luminous rays towards the crystalline lens; while the external orbicular eye-lid, which is attached to the circumference of the globe of the eye (the motions of which it follows) by a membranous compact and very fine fold of the conjunctiva, dilates or contracts its opening to modify the passage of the

luminous rays, by means of two planes of moveable fibres, circular and radiating, which enter into its composition. This opening, which indeed supplies the place of a pupil, has a rounded form, a little elliptical, which closes itself entirely, notwithstanding the assertions of some naturalists. There is another singular phenomenon observed in this reptile, viz. that its eyes move and perceive objects in opposite directions; if, for example, we enclose in a cage of glass, a cameleon and a small frog, this last animal, alarmed by the danger which threatens it, runs to the opposite side of the cage, and endeavours to avoid its enemy. The cameleon, without changing its place, follows its prey with one of its eyes, while the other remains immoveable; at the moment when the little animal expects it least, the cameleon seizes it with its long and flexible tongue, and swallows it with the greatest facility.

In a dissection that I made of a cameleon, during my residence in Egypt, I could not find any organ of hearing, which appeared to me to be wanting in this animal. It is no doubt for this reason that nature has endowed it with the faculty of perceiving at the same time with both its eyes, objects which are placed in opposite directions.

Prochaska, one of the most expert anatomists in Europe, has demonstrated by some exquisite injections, which I possess, that the structure of the radiating, and circular vessels of the iris is the same as that of the elementary muscular fibre. These injections demonstrate that these fibres, like the folds and coronary parts of the iris, as well as the spiral fibres of the arteries themselves, are formed of a series of small capillary arteries, very perceptible with the microscope, turning upon each other in such a manner as to form these fibres partly or wholly, according to the formation or particular use of each of these organs. These spiral capillary arteries are found twisted together and surrounded by an extraneous substance, which disappears by injection; and which the same anatomist asserted to be fibrine in the muscles, concreted or thickened albumen in the arteries, and a strong thin cellular tissue in the intestines and iris. We may compare, with propriety, as I have done in my memoir on hemorrhages, the disposition of these primitive arteries, these peculiar retractile fibres, to the filaments which compose cords of different sizes, and at last cables. These fibres shorten themselves by means of the engorgement of the vessels, or by the afflux of blood which runs through

them, in the same manner as cords, when in a certain state of tension, shorten themselves more or less by imbibing any liquid, as water. By these means we can elevate enormous masses; as for example vessels of war, which may be afterwards launched into the sea with the greatest facility.

As a proof of the truth of the assertion I have made, concerning the effect of this contractility, produced by the afflux of blood into the elementary vessels of the moving fibre, it will be sufficient to observe; that when a muscle is cut transversely, near the origin of its nutritive or organic arteries, the portion which is the most distant becomes incapable of contraction. The same thing happens in all the muscles, when the arteries sent to them are tied, at least until nature has replaced these arteries by other vessels which establish a new circulation. Besides, we think that the afflux of blood, into these minute vessels is produced by galvanic vital excitations, unknown in their nature; which arise no doubt from the encephalic nerves in the organs of locomotion, and from those of the ganglions in the muscular organs of internal life.

## ESSAY IV.

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### SOME OBSERVATIONS ON WOUNDS OF THE INTESTINES,

FOLLOWED BY A REMARKABLE CASE OF THIS SORT OF LESION.

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WOUNDS penetrating into the cavity of the abdomen, with lesion of the intestines, have been considered by all authors, with reason, as very dangerous and mortal. However, I have had frequent occasion to remark in my Campaigns, that these lesions, when they result from fire arms, are susceptible of cure. In making known the resources of nature in these dangerous cases, I have also pointed out the means to be employed, or the processes to be used to conduct these wounds to a happy termination.

Suppose, for example, that the projectile traverses a part of the cavity of the belly, in an adult, so that a portion of the tube of the ilium, or of the large intestine, is destroyed at a given point.



There will be attrition of the parts struck by the projectile, while there is produced upon the neighbouring parts to a certain distance, a commotion with stupor, from which will result a sensible contraction in the wound, and an engorgement more or less considerable in the surrounding tissue.

The intestinal substances either escape externally by the wound, or they collect at the wounded part, of which I have spoken, without communicating with the abdominal cavity. This is an admirable provision of nature, and indicates to the surgeon the course he ought to pursue under such circumstances. Following these salutary indications, I have taken care, in these cases, to seek for the wounded portion of intestine, to separate it and bring it to the edge of the opening into the abdomen, and to keep it there by means of a ligature passed into the mesentery; or to reunite the wounded gut by means of a suture. In both cases we have reason to fear a series of alarming symptoms, such as internal hemorrhage, which may result from the rupture of the adhesion, or the new division of blood-vessels; for the last operation cannot be performed without renewing the edges of the wound. We should especially apprehend the extravasation of the fecal matter into the cavity of the belly. It is necessary to attend to the adhesions, and

to content ourselves with applying to the wound fine lint covered with a balsamic unguent, and an appropriate bandage; however we should always dilate the edges of the external wound even to the aponeuroses.

After many battles I have had occasion to dress a great number of soldiers with wounds of this kind, and they have generally been cured in this way.

Until the eschars fall off, the alvine substances pass in small quantity by the wound; but afterwards, not finding any obstruction, they pass out in abundance, and continue to do so until the wound is clean. Then it becomes necessary to favour the approximation of the edges of the wound of the abdominal walls, and of the lips of that of the intestine by the assistance of adhesive straps applied over the first, and a light compressive and concentric bandage. The two wounds at the same time gradually contract; the corresponding parts come at last into contact, contract a mutual adhesion and form a cicatrix. This takes place first in the wound of the intestine, proceeding from the interior towards the exterior; the intestinal tube always undergoes a contraction proportioned to the loss of substance. The primitive adhesion, for the most part, becomes at last effaced, and the

parts which had been transposed, recover their respective and natural position with the return of their functions; a phenomenon which I formerly noticed of wounds of the abdomen in which the omentum has escaped.\*

Incised or punctured wounds of the intestines do not follow the same course, nor present the same phenomena; I think also, that their prognosis is more difficult, especially if they are of a certain extent; they require also the most prompt assistance.

One of the two following processes are generally indicated in their cure. One consists in retaining the wounded portion of intestine opposite the wound of the abdomen by means of a ligature passed into the mesentery, so as to prevent the alvine matter from escaping into the cavity of the abdomen; and allowing time to nature to insulate the wounded intestine, as happens in gunshot wounds, until the causes of irritation are entirely dissipated. The injured parts recover by degrees their natural position, and the lips of the intestinal wound approach each other to form a cicatrix, the ultimate object of nature. This is undoubtedly the most desirable and easy process.

\* See volumes second, third, and fourth of my Campaigns.

The second consists in bringing together the lips of the wound, by means of a simple suture, or an invagination assisted and sustained by ligatures passed into the thickest part of the two ends of the divided intestine, and sometimes with internal supports. This last method is recommended by John Bell, not only for wounds of the intestines with loss of substance, as gunshot wounds, or those resulting from gangrene, but even in simple wounds.

Without entering into a detailed consideration of the advantages and disadvantages of these different methods, I will point out, in a few words, that which I believe to be the best in punctured or incised wounds, as I have already given my opinion respecting gunshot wounds.

The process of Littre in wounds of the intestines, of whatever nature, is undoubtedly the least calculated to augment the irritation of injured parts; but it has also the inconvenience of prolonging the disease and inducing an artificial anus for some time. Sometimes also, notwithstanding every precaution, and before the injured portion of the intestines has contracted adhesions, it returns spontaneously into the belly, and allows the alvine matter, to escape into this cavity which becomes speedily fatal. At others, also that

portion of the intestine which protrudes beyond the external opening, becomes swelled, causing strangulation, with the usual symptoms which accompany it. For all these reasons, I am induced to believe that the method of the ancients, I mean the suture, is the most desirable, provided it be made immediately after the accident. It only remains to point out the best kind of suture, and the means we ought to employ to assist the salutary efforts, and to prevent the inflammation which generally occurs; such is the principal object of the following reflections.

In a suture for wounds of the intestines, it is necessary to keep in view the following points: *First.* To preserve the lips in exact contact. *Second.* To comprehend within the points of the suture only, the least possible portion of the intestinal tube, lest we so diminish its diameter as to present an obstacle to the passage of the fecal matter. *Third.* The mode of suture most suitable, is that pointed out above; for, whatever may be asserted to the contrary by authors, the reunion of wounds of the intestines is effected, as in other parts of the body, by their own vessels; and the adhesions will be prompt and easy, in proportion as the divided parts are brought into exact contact, and preserved in this state by the suture

indicated. In the experiments which I made upon living animals, in the Lectures on Surgical Anatomy and Physiology, which I delivered at Toulon, and Val-de Grace, in Paris, experiments which it is easy to repeat, the truth of the remarks I have just made concerning wounds of the intestines, was demonstrated. After having made one or more wounds, in different directions, in the intestinal tube, which was laid bare by an incision into the belly, in dogs of different ages, I united these wounds by means of the suture *du pelletier*, with the precaution of making it double, using threads of different colours alternately. These threads ought to be not only waxed, but covered with mild cerate. It is necessary to take the precaution of leaving them of sufficient length to be retained out of the cavity of the belly, until the period of extraction. Now the adhesive inflammation not taking place before the fifth day, it is prudent not to attempt to remove the ligatures before the seventh day, or they may even be allowed to remain until the ninth. For the purpose of extracting them, we ought to draw them gently in opposite directions, which may be easily done, as they are of different colours. The suture being made, we should take care to return the fold of the wounded intestine into the cavity of the belly,



so that it may move freely; for in retaining it at the edge of the external wound, as in the process of Littre, it is inflected in such a manner as to obstruct the course of its contents, and to cause an engorgement of its tunic.

I propose in preference the suture *du peltier*, because that which has heretofore been recommended by authors, embraces a much larger portion of the intestine, and favours the swelling and turning outwards of the edges of the wound, which are contrary to the true indications in such cases; indeed, mutual adhesion can only take place at the lateral points of the two lips of the wound. There may be, undoubtedly, adhesions of the edge of the wound with the other surrounding parts, but unnatural adhesions, whatever may be said to the contrary, are temporary; nature at last, insensibly, separates them to restore the peristaltic motion of the intestine, and thus to favour the course of the alvine matter. Before having remarked this disposition of adhesions in lesions or displacements of the intestines, I had observed the same phenomenon in wounds of the belly in which the epiploon had escaped, which, after having been retained at the edges of the wound through which it had passed by adhesions, often very extensive, relieves itself of these connexions, and returns

gradually into the abdominal cavity to its original situation.\* If it were not for this, the individual, in whom these organs are so essential to the functions of internal life, would be exposed to the greatest dangers. In unnatural adhesions, in artificial anus, even of the longest standing, when the opening closes in consequence of the re-union of the intestine, by means of the method of Desault, or that of Dupuytren; these adhesions, I say, become gradually removed, and the gut moves free in the abdominal cavity. This is more strikingly the case when the preternatural state of the anus is not the consequence of a great loss of substance in the intestine, and the adhesions are recent.

It is easy to convince ourselves of these physiological truths, by repeating my experiments on animals. Nevertheless, we have to oppose the inflammation, which has a tendency to develop itself constantly under the influence of the mechanical irritation, which the suture must necessarily produce. Certainly, from my experience, we cannot employ in these cases, more efficacious means than cupping with scarification; the application of which should be made at the instant that the first

\* See in my Campaigns the Memoir on Wounds of the Belly, in which the omentum had escaped; vol. iv. page 373.

inflammatory symptoms appear. We must apply it in a series of parallel lines, from the upper to the lower part of the belly. The applications should be repeated as frequently as may be judged necessary. The scarifications should be made with the instrument, which has been already described, and in such a manner as to run over, with this instrument, the whole surface of the skin which has been previously reddened by the cups; the air of which has been rarefied by means of a piece of fine tow, burnt in the bottom of the cups.

This method is preferable to the syringe, with which the spring scarificator is generally used, the incisions of which can only be made by pressing, which renders them more painful, more dangerous, and more imperfect, while, by my mode of scarifying, the punctures are uniform, and entirely under the control of the will of the surgeon. To these depletive and derivative topical remedies, we ought to add oily embrocations, luke warm baths, emollient enemata, and cold mucilaginous drinks, taken frequently in small quantities; general bleeding is sometimes indicated.

This constitutes the basis of the mode of treatment recommended by me in an essay on the yellow fever, addressed to the Academy of Medicine of New-Orleans. I hope the success will

answer my expectations; for the yellow fever appears to me to consist, principally, in an inflammation, more or less severe, of the serous membrane of the abdominal viscera; having for its principal symptoms, pains of the intestines and vomiting, as in spontaneous cholera morbus, a malady from which the yellow fever does not essentially differ. The cholera morbus, which succeeds to a mechanical irritation, acting directly upon the intestines, exhibits the same progress, and may have the same results; now, the indications are the same in all these kinds of affections.

When we shall have overcome the inflammatory symptoms, by the means which I have already pointed out, which we shall know by the cessation of those symptoms which characterize acute inflammations of the intestinal-gastric system, we may increase with advantage the peristaltic motion of the intestines, and favour the intestinal evacuations by means of calomel combined with fresh castor oil, or syrup *de chicoree* in suitable doses; by embrocations of the belly with camphorated oil of chamomile; and by emollient enemata.

Sometimes, especially when the engorgement of the injured parts assumes a chronic character, we are obliged to apply over the abdomen a vesicatory, consisting of powdered cantharides and cam-

phor, in equal parts; taking care first to expose the cantharides to the vapour of boiling water, for the purpose of depriving them of their irritating, volatile principles, without taking from them their power of causing suppuration. Lastly, we finish the treatment by the use of light tonics, such as the aromatic bitter infusions, with orange flower water, and dry, or slightly alcoholic frictions over the whole surface of the body.

It is necessary to keep the convalescent to a strict regimen, so as to prevent any obstruction to the alvine matter in the diseased portion of the intestine, which remains for a long time in a state of contraction and sluggishness.

The following case will illustrate the phenomena which accompany incised or punctured wounds of the intestines treated by suture, and at the same time it will confirm the precepts which I have laid down on this mode of treatment.

The subject of this case was named Jolin (Jean Baptiste) aged about twenty-three years, a fusileer in the sixteenth Regiment of the Guard. This soldier, while playing with one of his comrades in the field adjoining the barracks of Courbevoie, fell by accident upon the point of his sabre, which he held unsheathed in his hand, and which made a deep wound in the abdomen. He was

transported to Puteau, a neighbouring village, where the physician, M. Carré, gave him the first assistance.

“This soldier,” says M. Carré in a letter to us, after the cure of his patient, “had a transverse wound of about fifteen lines in extent, on the right side and at the lower part of the abdomen, with protrusion of a large portion of the ilium which was already tumefied. The patient complained of nausea without vomiting. I examined the portion of protruded intestine and there found a large wound, from which liquid stercoracious matter was discharged, which obliged me to make a suture at this point, immediately after which I returned the intestine into the cavity of the abdomen. I had not with me at the time needles and thread, but used that of a woman who was present, the thread was black; the wound was dressed and the patient sent to the Hospital of the Guard at Paris.” During the journey, which was very tedious, the patient vomited copiously, and had one bloody stool.

At his entrance into Gros-Caillou the Surgeon of the Guard removed the dressings and discovered a portion of the small intestines swollen, but not offering any appearance of a solution of continuity; this he returned into the cavity of the



belly without much effort. The patient being extremely weak, could give no account of what had passed; the surgeon therefore, not observing any thing remarkable in the protruded portion of the intestine, contented himself with reducing it by the taxis; he applied afterwards suitable bandages and prescribed mucillaginous drinks and emollient enemata. The patient, however, was not relieved; he passed the remainder of the night in a state of constant anxiety, with frequent vomiting of bilious matter, accompanied with violent colicky pains, tenesmus and small bloody stools.

At my visit in the morning, I saw the wound, which has been above described, but without protrusion of any of the contents of the abdominal cavity: I could learn nothing from the patient; he could only inform me that the surgeon who had dressed the wound at Puteau had asked for a needle and thread of a woman who was present at the operation, which he had seen in his hand; but he knew nothing of its having been used, because he had felt nothing.

However, conformably to my precepts in such cases, I unbridled the wound of the integuments, and the opening made by the sabre in the aponeurosis of the great oblique muscle, and I then discovered a considerable collection of blood, behind

the wound and in the peritoneal cavity; several convolutions of the intestines had already adhered together. Although the symptoms of strangulation still remained, I did not dare to break up these adhesions, and to seek for the strangulated portion of this viscus, lest I should increase the extravasation, or open again some arterial branches which might then be about uniting. I therefore contented myself with evacuating the extravasated blood collected in this kind of reservoir, and dressing the wound with a linen rag, covered with the unguent of styrax, with an appropriate bandage. A small branch of the ilio-lumbar artery having been opened in the incision, I passed a ligature about it and the hæmorrhage ceased.

The pulse of the patient was small and quick, the countenance pale and discoloured, the eye dull and watery, and the extremities cold; he had nausea and vomiting at short intervals, followed by small bloody dejections, accompanied with colicky pains and tenesmus; the abdomen was swollen. These symptoms alarmed me very much. I despaired of relieving my patient from the imminent danger in which he was placed. Nevertheless, I wished to employ cupping before attempting to discover the strangulated fold of the

intestine, which in cases of spontaneous volvulus had surprisingly assisted me.\*

I had scarcely applied the three or four first cups when the tumefaction of the belly became sensibly diminished; the patient experienced relief, and had shortly afterwards bilious stools mixed with clots of black blood. I repeated the application of this topical derivative in such a manner as to cover the whole surface of the abdomen. To the cupping, I added camphorated oily embrocations, light anodyne, emollient cataplasms, and enemata of the same nature, which were also accompanied with light bilious dejections, mixed with some striæ of black blood.

Through that night the patient was tranquil; but on the following morning the pains recurred with increased force, and were accompanied with nausea and some vomiting. The almost instantaneous relief which I had before procured from cupping induced me again to have recourse to it. I also insisted upon the employment of emollient embrocations, anodyne, mucilaginous drinks with ice, and especially upon emollient enemata.

I again obtained a sensible amelioration, all the worst symptoms disappeared, and the patient

\* I might relate many examples of this; I regret my not having been acquainted with this practice in the colick of Madrid.

remained quiet for eight or ten hours. They returned again, however, and nearly at the same hour. During the paroxysm, the abdomen became swollen; the alvine evacuations suppressed, the urine small in quantity and limpid, the colicky pains more or less severe, and the pulse underwent analogous changes. In a word, I repeatedly saw this patient in so alarming a situation that I momentarily expected to see him die.

However, after having repeated again and again, the application of dry cupping with scarifications; and after having insisted upon the use of sedatives and purgatives, especially enemata, I obtained a sensible amelioration, and so much success, that I at last conceived some hopes of saving this soldier. To arrive earlier at this desirable result, I applied over the whole surface of the abdomen a vesicating powder, consisting of equal parts of cantharides and camphor, which had been exposed to the vapour of boiling water. On the evening of the eleventh day of the accident, the patient himself remarked two phlegmonous engorgements, which were formed in the parotid regions. Indeed, from this moment, all the inflammatory symptoms suddenly disappeared from the abdomen, and on the thirteenth day, the patient had copious stercoracious dejections, assisted, no doubt.

by a few grains of calomel administered the evening before, in some castor oil and syrup, *de chîcoree*. I favoured the suppuration of the parotid tumours by the application of cataplasms, and, as soon as there was evident fluctuation, I applied the caustic potash, which accelerated the process of suppuration, and allowed the discharge of a large quantity of purulent matter, which was formed in the cellular tissue. This salutary crisis was immediately followed by the discharge through the external wound, of a small cord about three and a half inches long, formed of a bit of black thread tied at the end, which presented itself first at the wound; I removed it in the presence of the young physicians who attended my Clinical Lectures on Surgery, of which Jolin, at this time, constituted the principal subject.

The unexpected discharge of this ligature, proved to me what the patient himself had declared shortly before, that a suture of the intestine had really been made, and I could then easily account for the phenomena which I had observed in the course of this disease. This circumstance induced me to write to the gentleman who had first seen the patient, in order to obtain from him information of all that had been done at the first dressing; I have already reported his answer.

The patient grew better and better, nor was his convalescence tedious or painful.

The wound of the abdomen soon cicatrised; all the functions gradually returned; before the seventieth day of the accident, the patient was completely cured, and left the hospital by the eightieth. Every thing indicated that the adhesions which I had at first observed in the convolutions of the wounded intestine, which I think was the ilium, were spontaneously detached, and that the peristaltic motion was restored in this intestine; that the causes of irritation were dissipated; and that the cicatrisation of the intestine had completely taken place.

The kind of needle, and the mode of suture, contributed much towards this happy termination. Under the article *Aiguille*, in the "*Dictionnaire des Sciences Medicales*," I have remarked, that for the suture of the intestines, the common sewing needle, rather fine, is preferable to that which we use for wounds of the integuments; (for the reasons of this opinion, see this article.) The hæmorrhage which took place at first in Jolin by the external wound, and by the intestinal tube, was the effect of the division of a great number of small arterial branches in the parietes of the abdomen and intestine. It is also very evident



to me, that the inflammation which attacked all the membranous viscera of this cavity was advantageously combatted by the repeated application of dry and humid cupping. In a word, I can hardly say too much in praise of these therapeutic agents, in acute inflammations of the abdomen and chest. I am satisfied that they powerfully contributed to this remarkable cure.

This soldier was presented to the Society of the Faculty of Medicine, and I have seen him frequently since this time; he enjoys perfect health; every thing shews that the intestine had lost its adhesions, and that it floated freely in the cavity of the abdomen, like the other portions of the small intestines. There was some appearance of a hernia at the cicatrix, which was prevented by the application of an elastic bandage.

## ESSAY V.

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### ON FRACTURES OF THE NECK OF THE FEMUR;

FOLLOWED BY SOME REFLECTIONS ON THE FORMATION OF CALLUS IN  
FRACTURES IN GENERAL.

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THE uncertainty which has heretofore prevailed in our ideas of the formation of callus, in fractured bones, and of the mode of restoration in bones seized with necrosis, has certainly retarded very much the progress of our knowledge in this branch of pathology. We have been prevented from attaining to that degree of perfection in the treatment, which we might otherwise have reached, at a period when French surgery is illustrated by so many discoveries, if we had been less prejudiced observers of the phenomena which accompany the consolidation of bones in fractures. The great number of facts which have presented themselves in my practice, during the quarter of a century which has just elapsed, have induced

me to study the laws by which nature accomplishes this consolidation; and have enabled me to analyze these phenomena. to mark their progress, and to verify the judicious assertions which have been made on their character by a great number of physicians, surgeons, and physiologists, who have also formed their opinions on experience. Of this number are Brun, one of my first masters, and Professor in the ancient College of Surgery, in Toulouse; Scarpa and Pinchinatti, celebrated Italian surgeons; and Richerand and Lèveillé, my honourable colleagues. The result of these researches, and my observations, have led me to establish modifications on the methods generally pursued in the treatment of fractures, which seem to me to have perfected the means indicated in the reduction of these fractures. But in the expectation that I may hereafter compose an entire work on this subject, I shall limit myself in this notice to what appears to me to be the most interesting, and on which authors have differed most.

Fractures of the neck of the femur, for the most part, take place in persons who have passed the earlier periods of life, and rarely before the time when ossification is entirely finished; that is, at the first approach of old age. The density that the bones acquire at this period, and especially

at a more advanced stage of life, the insulated state of the neck of the femur, and its oblique direction, enable us to account for the facility with which this small portion of the bone may be fractured.

Indeed it should be recollected; *First.* That the neck of the femur diminishes gradually in thickness, and increases in density as the patient advances in years. *Second.* That this portion of the osseous cylinder is intersected obliquely from its base to the head of the femur, in which it terminates, by the axis of the thigh, at the extremity of a long lever. *Third.* That this portion is free and insulated within the capsular ligament, while the head of the bone is fixed in its cavity by an inelastic and very strong ligament. *Fourthly,* and lastly. That it is not directly protected by any of the thick muscles which surround it.—When we recollect these circumstances, we can easily conceive that this portion of the femur, especially in advanced age, must be exceedingly liable to be fractured by mechanical causes, even the most trifling, when they act upon the opposite extremity of the lever formed by this bone, in the direction of the obliquity, and towards the projecting angle of union which the base of this eminence forms with the great trochanter. This is evident,

because on the one side of the powerful resistance opposed to the head of the bone in the deviation which it experiences at the moment when the mechanical cause acts; arising from the external and superior wall of the acetabulum, the very thick edges of which rise above the level of this spherical eminence, and prevent its luxation in this direction. On the other hand, the percussion, or violent efforts, acting towards the two designated points, concentrate themselves at this portion of the extremity of the lever, which intersects suddenly and obliquely the axis of the column of support of the individual; and carrying their effects upon the oblique and fragile portion of the neck of the femur, the fibres which compose it being extremely distended, must necessarily give way. Thus, for example, if, after having slipped upon the external edge of one foot, so as to suddenly displace that of the opposite side, and having lost his equilibrium, one falls upon the trochanter of the limb first displaced, the fracture of the neck of the femur is inevitable.

This fracture may likewise present variations, according to the various causes which produce it, and the differences which may exist in the situation of the patient at the moment of the fall.

When a fracture has taken place at some point of the neck of the femur included within the articular cavity, (and it is of this part of which I wish to be understood exclusively to speak,) the symptoms or phenomena which characterize it *are*, and *must* always be the same, and can only be confounded with the separation of the epiphysis of this eminence, from the effects and indications of which it does not essentially differ. Besides, this solution of *contiguity*, only takes place in young subjects, while that of *continuity* in the neck of the femur does not generally happen, except at a period when this part of the femur has lost its elasticity.

The first sign of fracture is the immobility of the limb, and incapacity in the patient to use it for his support. In examining it afterwards with care, and comparing it with that of the opposite side, we find it in a state of retroversion from within, outwards, so that the sole of the foot is almost in a transverse line. There is an unnatural elongation when compared with the other limb, and, contrary to the opinion generally received, we can hear and perceive very distinctly, when the thigh is put in motion, a crepitation of the osseous fragments; pain is felt in the region of the joint, and swelling soon comes on, &c



I have asserted that these symptoms were, with very few variations, almost always the same; for if we represent to ourselves the parts which are connected with the ilio-femoral articulation, especially the attachments of the muscles of the pelvis to the thigh bone, we may easily satisfy ourselves that in every case of fracture of the neck of the femur, the whole of the limb will experience at the moment of the fracture of this bony part, a rotary movement from within, outwards, and from behind, forwards. This is evident, because all the muscles which move the thigh, attach themselves by their tendons to the two trochanters, situated on the outside of the articular cavity, and below the base of the neck of this bone, so that the insertion of the greater number of these muscles is made in an oblique line from the iliac, pubic, and *obturatoric* regions, to the summit of the little trochanter, and the small tendinous cavity of the great trochanter, turning from before, backwards, and from within, outwards, the inner side of the articulation. All these muscles, I say, contracting themselves simultaneously, must produce the retroversion of which I have spoken, and throw the foot outwards; this symptom is uniform.

The elongation is explained by the loss of the curvature, or obliquity, which the thigh bone

makes at its superior extremity. The two fragments of the neck of the femur being broken and separated, are necessarily drawn from the situation they were in previous to their solution of continuity. in an oblique direction; because on one part, the weight of the thigh, and its rotation outwards, change the relations of the inferior fragment, dragging it a little downwards; while on the other, the round ligament retains the head of the femur, with the superior fragment, in the acetabulum, in the same situation as before the fracture. For this fragment does not, nor cannot experience any deviation; its head must remain immoveable, in consequence of the swelling which takes place in the interarticular ligament, the length and flexibility of which diminish in the same proportion.

It is important to recollect the anatomical structure in the treatment of this accident. For these reasons, the elongation must be accounted a constant and primitive sign of this fracture, though the limb may at last become shortened by the fragments riding over each other. Lastly, fracture of the neck of the femur must be considered a more or less important accident, in proportion to the age, health, and corpulence of the patient.

The bones unite with difficulty in persons far advanced in age, and in those affected with any

specific morbid vice; but, however complicated, the indication is always the same. The treatment of this fracture ought always to be established on the same principles; and these should be founded on a perfect knowledge of the laws which nature observes in uniting solutions of continuity, or in restoring a loss of substance in bones. It is the uncertainty of this knowledge which has led to the formation of a great number of different opinions among authors and practitioners, as to the means to be employed in the reduction of these fractures. Indeed, if all surgeons were convinced that the union of bones, or the callus which serves to produce the reunion of the fractured portions, and to repair or cicatrise solutions of continuity in them with loss of substance, could be effected by the vessels of those osseous parts which remain sound, and not by intermediate substances, nor by the ossification of the fibrous or cellular membranes which envelope them, or line them internally, they could not certainly differ as to the process to be employed to favour this operation. But if we are impressed with the idea that callus can only be formed by the aid of the periosteum, or by the interposition of a peculiar albuminous substance between the fragments, designated by the partizans of this opinion by the name of *fibro-*

*cartilage*, we must necessarily invent processes which can fulfil these different views.

Thus, according to the first hypothesis, the partisans of ossification by the periosteum endeavour to bring back the lower fragment of the neck of the bone towards the internal attachments of the capsular ligament; endeavouring to apply this fibrous sac as much as possible about the fragments, for the purpose of obtaining from it a union, not to be obtained from the periosteum, inasmuch as the neck of the femur is destitute of it. (There is, however, a thin tissue, the fibres of which are more perceptible at the anterior part, and appear to arise from the internal attachments of the ligament. This tissue, which is composed of parallel fibres, differs nevertheless from the periosteum.) According to these views, fractures of the neck of the femur are considered as incurable, that is, as being necessarily accompanied with false articulations, ankylosis, or great infirmities. The means formerly resorted to, and still used, concur powerfully in producing these results. One of the most powerful of these was the *spica* bandage, applied about the diseased joint.

According to the second hypothesis, in order to obtain a more solid and thicker callus, an attempt is made to separate the inferior from the superior

fragment, for the purpose of favouring the deposition and formation of the intermediate substance proper to produce callus. It is with this intention that bandages, or apparatuses for producing permanent extension of different forms, and of a mechanism more or less complicated, have been invented. By these means, instead of assisting nature in its work of re-organization, the object is rendered more remote, the evil aggravated, and sometimes rendered incurable; or the cure is retarded; a circumstance which is not exempt from serious consequences. From the time of Hippocrates and Avicenna, until the present day, a prodigious number of apparatuses, of permanent extension, have been employed, from the application of which, there can be no doubt that there has never been any benefit derived.

Whatever may be the mode of extension, in fractures of the neck of the femur, it is not only useless, but generally pernicious. It is useless, because the displacement of the fragments cannot extend beyond the thickness of these fragments, except from a considerable rupture of the articular capsule, and from the projection which may be made through this rupture towards the *obturatrice forosa*; when the inferior portion of the neck of the femur is separated from the head of

the bone which remains immoveable in the acetabulum, where it is retained by the round ligament; this circumstance is very rare. The inferior fragment, whatever may be the contraction of the muscles which are inserted towards its base in the two trochanters, cannot ride over the superior, because this last fills the articular cavity. But these two fragments may lose the relation of their first points of continuity, when they are not kept in this state by the proper means. A displacement of the lower fragment inwards, so as to bury itself in the *obturatrix* region for example, does not readily take place; except from improper management or violent efforts, before the patient is prevented by severe pains which give him notice of the danger of moving, and induce him to remain in a perfect state of repose. In any state of things, the inferior fragment cannot separate from the edges of the acetabulum but a few lines; and it is easy to bring it back by the most trifling efforts into its first situation, and to place it in contact with the superior fragment, for which extension is perfectly useless.

Extension is especially injurious when it is permanent; because the effects of it extend to the ligaments of the ilio-femoral articulation, which are already torn; the distention of them causes



shooting pains, and frequently new injuries, from which result traumatic fever, and the accidents which accompany it. These same accidents may also affect the joints of the foot and knee, upon which we are obliged to attach and to put in action the ligatures of this complicated machine. But other evils arise besides the violent pains in the articular ligaments of all the joints of the extremity, notwithstanding all the precautions that can be taken, in consequence of the long time which we are obliged to keep up the action of the apparatus. The integuments are apt to be affected so as to produce ulcers, often difficult to cure. But should nature resist all this violence, there will remain a preternatural elongation of the injured limb, arising from the imperfect manner that the two fragments were brought into contact originally. For by the permanent extension, we take away from the neck of the femur its obliquity, which determines this elongation; as I have observed in my memoir on femoro-coxalgia,\* where the same phenomenon is described. This chiefly arises from the rupture of the inter-articular ligament, or from the erosion of this ligament, which then becomes incapable of retaining the

\* See the third volume of my Campaigns.

femur in its natural situation; the elongation of the limb is then determined by its weight.

On this point, the question proposed by the Professor of Montpellier, respecting the effects of the fracture of the neck of the femur, may be resolved contrary to his opinion. Nevertheless, this opinion is founded in the supposition, and I do not doubt it, that this celebrated surgeon intended to treat fractures of the neck of the femur, not with machines for making permanent extension, but only with a retentive apparatus, proper to aid the indications of nature in the formation of callus. When the union is perfect and exact, it will be necessarily followed by a shortening proportioned to the nature of the fracture and age of the patient. In no case can this shortening exceed three or four lines, except from a loss of substance. But the greater the density of the bone, the greater will be the obstacles to the softening of the extremities of the two fragments, in order that the vessels may become developed; permanent extension must certainly augment, and in fact does augment these obstacles. Notwithstanding all these inconveniences, almost all authors who have heretofore written on fractures of the neck of the femur, extol this method for their reduction; nor do practitioners cease to employ it;

we also see but few perfect cures obtained from this method.

This want of success, and the serious accidents frequently the consequence of this mode of treatment, induced some celebrated surgeons of the last century to lay aside these machines, and to abandon the fractured limb to a simple relative position, without the application of any apparatus. Thus, for example, Sabatier, my illustrious master, caused the patient to be laid on a straw bed, well stuffed, and placed the fractured limb between two long cushions, filled with oat chaff, which were attached by means of strings. Mursinna, surgeon general to the army of the king of Prussia, kept the leg bent upon the thigh, and this upon the pelvis, by means of a roller, which maintained the limb in this state of flexion.\* Of late, permanent extension has been again brought into fashion, and constitutes one of the principal articles in the *Dictionnaire des Sciences Medicales*, in which the machines employed for this extension are represented.† Thus men pass from one extreme to another.

\* M. Canin, *ex-principal* surgeon to the army, has given me a drawing of the apparatus applied to the patient.

† See volume ninth of the *Dictionnaire*.

Indeed the methods of Sabatier, Mursinna, and other surgeons equally respectable, have their inconveniences. The most important, no doubt, is the mobility of the limb, or its want of fixedness, from which results a relative displacement in the fragments, by the different movements executed by the patient; an accident which destroys their connexion, retards and even prevents the formation of callus, or at least renders the union deformed, so as to deprive the limb of its natural conformation and rectitude.\*

If we suppose that, in the process of Mursinna, the limb, which is held in a state of flexion, remains perfectly immoveable; the callus formed during this position will oppose itself to the extension of the limb, which will also lose considerably in its length; support will then be difficult, and progression impracticable without assistance, in consequence of this permanent flexion.†

\* I have seen in some persons, who had suffered a fracture of the neck of the femur, and for which the method of Sabatier had been employed, a false articulation formed in the place of the fracture, from a want of union of the fragments, owing to their constant motion. The same accident may also take place in consequence of permanent extension carried too far. I have seen several instances of this in soldiers treated after this method, one case of which will be reported hereafter.

† M. Ribes has shewn to me a femur in which the superior fragment is implanted in the spongy substance of the trochanter, and in a situation analogous to that in which the thigh is placed in the apparatus of Mursinna. M. Ribes's patient had died, the thigh remaining bent.

This will be easily understood if we attend to the relative situation of the ends of the two fragments of the neck of the femur, when the limb is placed in this situation. This relation is such, that the head of the bone remaining fixed at the bottom of the acetabulum, in a line nearly perpendicular, cannot be in contact with the other fragment, except at the anterior half of its fractured surface; and the inferior fragment will not touch the other, except at the superior half of its fractured surface. Now there cannot be adhesion and communication between the vessels of the two fractured surfaces, except at these two points, instead of taking place through their whole extent; from which there must result a callus less extensive, less solid, and one that requires a much longer time to form.

I have seen several patients, treated according to this method, afflicted with serious infirmities, and even die in consequence of this permanent extension. I might cite, in support of these observations, a great number of examples, but this I conceive would be useless to those acquainted with the structure of these parts. I however wish that practitioners would compare the methods at present used with that which I am now about to describe. I will, however, relate a curious fact in

support of my opinion respecting the serious inconveniences attending permanent extension; which the celebrated Hunter communicated to his pupils, when lecturing on diseases of the bones. I shall translate it from the Italian, as related by Doctor Alsalini, late first surgeon to the viceroy of Italy, and one of the pupils of Hunter; this fact was observed at Edinburgh.\*

“A patient endeavouring to escape from the lunatic hospital, in which he was detained, climbed up the garden wall; but he had scarcely reached the top when a large stone was detached, and threw him back into the garden and broke his leg. At the cries of this unhappy man, several persons ran and transported him to his bed. The surgeons being called immediately, applied the apparatus used in fractures. The patient remained tranquil for some hours, but then began to complain of the conduct of the surgeons, who he accused of being mistaken. He continued to assert that they had dressed the sound leg instead of the one that was fractured, and urgently called upon them to take away the splints in which they had so strongly bound his leg. Being threatened with a straight jacket, he became silent, and pretended

\* See the Manual of the Army Surgeon, by this author, in two small volumes.



to feel great relief, so that he might be left alone. During the night, he took advantage of the absence of the attendants, to remove the apparatus, and applied it as well as he could to the sound limb; he afterwards enveloped the fractured limb in a pillow of feathers, and carefully concealed it in the straw of his bed, taking care, no doubt, to keep the limb straight.

“On the other hand, he allowed the limb which was covered with the apparatus to be exposed to view, but without suffering his medical attendants to approach too near; keeping them off by feigning a paroxysm of madness whenever they wished to come near him. He remained in this situation for a long time, and as his attendants always remarked that the limb was well bandaged, they assured the surgeons that it was in a favourable state. The patient would not allow the surgeon to examine the bandage until he thought himself well; at last, however, he undeceived him, by exposing the injured leg, which was still covered up in the pillow. After having removed it from this envelop, and washed it, the surgeon was very much surprised to find the limb well, and perfectly straight.” This is certainly a useful lesson, though given by a madman.

From what I have said respecting the fracture of the neck of the femur, there are two indications to be fulfilled to facilitate the union of the fragments and to conduct the patient to a cure. The first consists in placing the fragments together; in giving to the patient and fractured limb a suitable position; and performing coaptation, without making either extension, or counter-extension. The relative position and rectitude of the limb being established, it is necessary to preserve it in this situation by a retentive apparatus. The parts of this apparatus and the mode of applying it constitute the subject of the second indication.

The condition necessary for fulfilling the first indication are; first to place the patient in a horizontal position, so that the thigh is parallel with the pelvis. In this situation the two fragments of the fractured neck of the femur are in contact at every point; so that when the inflammatory process takes place, the blood-vessels belonging to each fragment, as they become developed and elongated, will adhere and anastomose together, to form the callus; a condition which is absolutely necessary.

The membranes, we repeat, contribute but indirectly to this purpose; in this new ossification

they fulfil no other function than that of transmitting to the bones, which they cover, the vessels necessary for their nourishment. Except from a morbid condition, or from an aberration of vital properties, these membranes do not become altered, nor participate in cases of preternatural ossification, which we sometimes observe in certain chronic inflammations; under the influence of which we frequently see a great number of different tissues converted into a substance of an osseous nature or having an osseous appearance; these it will perhaps be most proper to call *ossi-form concretions*. But when a healthy and natural ossification takes place, solely destined to unite bones which have been broken or separated by any cause, or to repair an accidental loss of substance in them; this ossification must be performed, and in fact is actually performed in the same manner, and according to the same laws as those which preside during the formation and growth of the bones. It must certainly be acknowledged at present, notwithstanding the assertions of the greater number of physiologists of the last century and of some modern anatomists, that this ossification is the result of arterial action; as is evident from maceration in diluted muriatic acid, and the diseases which

attack the tissue of the bones. These vessels are particularly evident in the callus where the bones unite. Nature, I say, after having produced a vascular network, which passes out from as many centres as there are principal nutritive arteries, extends their ramifications to the different points of the circumference; these constitute so many points of ossification, the number of which is always proportioned to the extent of the convex or concave surfaces of the bones. In every instance these points of ossification develop themselves uniformly from the centre towards the circumference, so as to have no connexion with the periosteum. Sometimes even these vascular, divergent shoots of ossification penetrate into the tendinous insertions at the extremities of bones. This is seen in certain gallinacious birds, and I have several times remarked it in man. There is preserved in the Cabinet of Anatomy of the School of Surgery, of the Marine of Brest, the skeleton of a galley-slave, in which are seen on the extremities of the bones of the limbs and that of the pubis, as many osseous processes or points of different forms and sizes as there are tendinous insertions. The base of these processes is continued to the bone, while the point was lost in the substance of the tendon.

If we follow attentively the transmission of the colouring matter in the bones of young animals fed on madder, we shall see, very distinctly, as was observed by Haller, the process of ossification to be made in directions diverging from the principal nutritive arteries towards remote points, and we should not find one atom of colouring matter in the fibrous tunic of the bones. There are certain gallinacious birds, for example the black Spanish hen, in which the periosteum is of a brown colour; the bones of this bird, however, have the same white colour as those of other animals. Professor Andravi, being at the Practical School in 1790, shewed us one of these birds, in which I remarked this peculiarity. It is easy to repeat an experiment that I made at this Practical School. It consists in separating a portion of the cylinder of one of the long bones, as the humerus, in a living animal, and cutting the two ends of the bony cylinder, thus denuded by means of a chissel or gouge, taking care to avoid the periosteum. No reproduction of the bone will take place, but the cavity will remain in the limb with a false articulation. Thus I have seen many individuals who, in consequence of fractures of the limbs, especially the arms, had lost a great part of the body of the

bone, which the disorganizing cause had separated from its periosteum; as many parts remaining imperfect in these instances, as there were places in which there had been loss of substance in the cylinder of the humerus.\*

When, by any mechanical cause, a portion of one of the bones of the fore-arm or leg is destroyed, so as to cause a considerable loss of substance, if the neighbouring bone has not been fractured, the cicatrix, which results from the wound with loss of substance, remains depressed; presenting a proportionate excavation or cavity, no reproduction of the bone having taken place. But there is nothing to prevent the gelatinous or albuminous substance of modern anatomists being poured out into this space; or the ossification of the surrounding fibrous or cellular membranes, of the physiologists of the last century, from taking place. The fact is, that the new ossification, necessary to replace this loss of substance, does not occur; because the vessels of the two fragments being considerably distant from each other cannot elongate themselves sufficiently, so as to anastomose and adhere together to form callus, or to repair the loss of bone.†

\* See the second volume of my Campaigns.

† See the design of the two bones of the leg in volume eighth of "the Journal Complementaire."



The instances which we see of the apparently complete reproduction of bony cylinders, after necrosis, are not affected by means of the periosteum, as the greater number of ancient and modern authors have supposed; but by the vessels of the *cortical substance* of the bone remaining sound, though the core or internal part, is in a state of necrosis. This internal part presents at its surface inequalities, and furrows which have, very improperly, been attributed to the effect of the absorbents; but in fact they are the result of the separation of the internal vessels of the sound cortical layer from the external surface of the dead part of the bone with which it was in contact. This process, a sort of osseous vegetation, develops and extends itself more or less according to the age of the patient, and the period when the foreign body has been extracted. If the patient be young, and the dead part removed at a proper period of the disease, the two broken portions of the shaft, in which it was enclosed, develop themselves in every direction, and at last fill up the whole space previously occupied by the dead bone; often involving in their action a great part of the limb, inducing swelling, with temporary induration of the fibrous membranes and other surrounding parts, which have led to the belief of a

true ossification by the periosteum. But afterwards every part returns to its natural state; the walls of the bony case approach each other, the cavity is gradually effaced, and this new osseous portion reduces itself to a volume proportioned to the degree of development of the vessels of the cortical layer. But, except from a new disease in the new bone, which may then cause it to undergo every kind of aberration, as I have before said, there will always be a depression and shortening of the limb, proportioned to the loss of substance of the old bone. But it is not my purpose to extend my reflections upon necrosis. This subject is treated with great care and profound erudition in the *Dictionnaire des Sciences Medicales*. Besides, all my remarks, drawn from experience, have already been made by Haller, Scarpa, Brun, and other celebrated surgeons of the last century.\*

The absorbents have no power of acting upon hard bodies which are separated from living organized parts. Thus, I have found fragments of bone, which were separated from their membranes or fibrous attachments at the instant of their fracture, in gunshot wounds, remain for whole years in the living parts, and still present the same form and polish, (especially when they

\* See the works of Richerand and Leveillé.

belonged to a part which was compact,) as at the period of their separation from the fractured bone.

I might relate in support of these physiological truths, a great number of facts; but it will certainly be sufficient to present the following reflections, to complete the solution of the problem which at present occupies me.

In the operation of trepanning, for example, the pericranium is removed by means of the raspatory, and we have never seen the dura mater form bone to close up the hole made by the cylindrical saw. How then is this effected? It certainly does take place in proportion to the age of the patient, and the loss of substance. When he is young and the crown of the trephine small, the hole may be closed up entirely. In all cases, we see the edges of the opening grow thinner, and approach each other from the circumference towards the centre, so as to leave a hole scarcely perceptible, and which disappears with age. This process of ossification does not surely belong either to the pericranium or dura mater; the first membrane at least is destroyed; and if the second concurred in the ossification, it would form a sort of vertical stopple, which might be seen and easily distinguished. Besides, we may

imagine that disagreeable consequences would result to the functions of the brain from this osseous production through a hole made in the cranium.

The following case is an illustration of what I have advanced.

In a manœuvre of cavalry, at the Champ-de-Mars, under the command of Marshal Bessières, on the first of June, 1803, the Sieur Plaigniol, aged twenty-five years, a brigadier in the corps of horse grenadiers, was thrown with his horse at the instant of a charge, and crowded beneath the feet of the other horses of his company. When he was taken up after the charge, he was found to be without appearance of sense or life; he was transported to the hospital, where the surgeon of the guard paid him every attention; his situation was most alarming.

The following morning at my visit, I discovered a contused wound in the right parietal region, near the orbit, with fracture of the subjacent bone. There were swelling and ecchymosis of all the soft parts of the cranium and face, especially on the right side. The shoulder of the same side was also extremely discoloured, and there was an evident crepitation along the spine of the scapula, which was fractured. All the rest of the surface

of the body was spotted with ecchymosis. The pulse was scarcely perceptible and very slow, the extremities cold, and all the intellectual functions suspended. He had bled from the nose, mouth, and ears, and the fœces and urine were discharged involuntarily; indeed, his death was momentarily expected.

Notwithstanding his desperate situation, I was anxious to have recourse to all the known resources of art. With this intention, I laid open the wound freely, and exposed, through its whole extent, a star-like fracture, at the point where the anterior and superior angle of the parietal bone unites with the corresponding point of the frontal. Several branches of the temporal artery were tied, and the fractured parts scraped over their whole surface, to enable me to apply the trephine. I was content at the time with a simple and common dressing. Repeated cupping was applied about the chest and shoulders; embrocations of hot camphorated vinegar were made over the abdomen and lower extremities, and cordial drinks and stimulating enemata were administered. After dilating the wound, the patient began to exhibit some signs of life, and to utter a few words; the pulse and heat became more developed; slight convulsive motions of the right side of the

body became manifest, while the whole of the left side was seized with paralysis; the alvine and urinary dejections still continued involuntary, and the patient was much agitated. A copious bleeding from the arm was made in the course of the night, and mustard cataplasms applied to the feet. On the fourth day, symptoms of compression of the brain being developed, I did not hesitate to apply the crown of the trephine at the lowest point of the fracture, at the angle of a depressed part. This last was removed, when there issued from the cavity of the cranium about an ounce of black fluid blood, which was extravasated under the anterior lobe of the brain, between the falx of the dura mater, and the fissure of Silvius; this meninge of the brain was torn to a considerable extent, and there was ecchymosis of the external surface of the designated portion of the encephalon. The extravasation seemed to have extended deeply, for the blood, without changing colour, continued to run out for several minutes, the head having been placed in a favourable position. After this operation, the patient recovered in part the use of his senses, with the exception of his sight, of which he was totally deprived. The danger continued for nine or ten days; but at last suppuration took place, a part of the dura mater



exfoliated, granulations developed themselves in all directions, osseous laminæ detached themselves successively from edges of the opening, the swelling about the face and cranium gradually declined, and, after the fortieth day of the treatment, the cicatrix of this large wound was completed from the circumference towards the centre. One part remained for a long time fistulous, and deeply depressed. The pulsations of the brain were perceptible through this thin and cellular cicatrix, the opening not being completely closed up for several months; however, it became gradually consolidated, and the pulsation disappeared. Lastly, notwithstanding the loss of substance resulting from the application of the trephine, and the extraction of the detached fragment, as large as that removed by the crown of the instrument, the vessels on the edge of this bony opening developed and elongated themselves so as to come in contact and contract mutual adhesions, and to close entirely the vacuity which before existed. The cicatrix is so perfect, that at present this opening cannot be traced.

The hemiplegia was gradually dissipated under the influence of moxas applied to the nape of the neck, and sides of the spine. The sight was imperfectly restored in the left eye, the vision of the

right being entirely lost. I think that the force impressed by the percussion of the hoof of the horse, ruptured the optic nerve of this side, while the extravasation which compressed the medullary substance of the brain, giving origin to the nerve of the opposite side, had the effect of weakening and suspending the vital functions of this nerve, which the moxas contributed to restore. The same is true as respects the memory of names and objects, which this soldier had entirely lost; for he could with difficulty remember his own name for several months after his fall; this faculty, though partly restored, remains still very imperfect.

Fractures of the maxillary bones, the periosteum of which is very thin and almost entirely invested with tendinous insertions, unite very readily when the fragments can be kept in contact, because the vessels of these bones are very numerous and develop themselves easily, in consequence of the number and size of the nutritive arteries which penetrate into their substance; the callus is also very rapidly formed, especially in young subjects. But we must not suppose that nature requires the presence of this intermediate substance in order to produce a union of these bones, more than in the other bones of living parts. Lastly, I think that it is the vessels only of each fragment

that establish their union and consolidation. In all cases, the reduction of the dimensions of the jaw or maxillary bones will be proportioned to the extent of the loss of substance, because the space left by this destruction is not filled up. Also if we neglect to put together the bony fragments, after having extracted the foreign bodies, there will remain with a mobility of the fragments, 'a vacuity proportioned to the loss of substance.\*

I have seen in many patients, especially young persons, the compact substance of the first laminæ of one of the long bones, the tibia for example, exfoliate, after having lost their vitality by some cause which had destroyed the periosteum over its whole anterior surface, as hospital gangrene. I have seen these laminæ replaced by granulations, vascular and of a bright red colour, arranged in parallel lines which succeeded the dead laminæ as fast as they were detached. These vascular granulations became soon ossified; that is the phosphate of lime was rapidly substituted for these red vessels, giving to them the colour and

\* See among other cases which confirm this remark, that of a person named Vauté, a corporal in the 88th demi-brigade of the army of Egypt. This soldier survived his wound for eight years. He died a violent death in the hospital of Charenton. The prepared head of this patient is deposited in my cabinet of morbid anatomy. For a minute account of it see the *Dictionnaire des Sciences Medicales*, vol. xxix.

consistence of bone. A new cellular membrane of considerable density, furnished by the neighbouring tissues, afterwards extended over this new ossification; but there remained always at the cicatrix a depression, proportioned to the loss of substance.

The patella exists under the same anatomical circumstances as the neck of the femur, the fracture of which constitutes the principal object of this memoir. That is, it is equally destitute of periosteum, being covered with a thin tissue composed of parallel fibres, which is evidently a continuation of that of the tendon of the extensor muscles of the leg. It has been heretofore believed, therefore, that it cannot unite when it is divided by a fracture through its whole thickness. Nevertheless, the re-union or consolidation of the fragments may be perfectly made, often without leaving the least trace of the fracture, when they are brought into immediate contact by a suitable apparatus; this I have repeatedly witnessed. This reunion is effected by means of the communication of the vessels of each fragment, which develop themselves the more readily as this bone is very spongy. On the contrary, where the means of re-union are neglected, there remains a proportionate separation; the fractured edges of the fragments

becoming somewhat thinner, though they preserve nearly the same volume as at the period of their fracture. A fibrous band, forming a ligament common to both fragments, is developed; this is derived from the fibres of the triceps extensor femoris, in the substance of which the rotula is embedded like a sesamoid bone.

These fibres, being at first separated from the fractured patella, contract themselves laterally and afterwards elongate themselves to produce this ligament, destined to unite the two fragments, and to prevent a too great separation. Sæmmering has injected the vessels of the callus which unites fractured bones.

Anchylloses of the joints, which arise from age, prolonged immobility, or a latent and chronic rheumatism, are formed without the assistance of a fibrous medium, but exclusively by the vessels of the parts which are in contact. These bones lose at first their articular cartilages; the points deprived of this cartilaginous envelop become gradually inflamed; the extremities of the osseous vessels lose their curvature, and, if I may be allowed the expression, develope and elongate themselves, and endeavour to anastomose together and thus to form a union. Any one may convince themselves of the truth of this by examining the

skeleton of Peyret, deposited in the museum of the Faculty of Medicine.

In some patients attacked with caries of the vertebræ, who I have had the good fortune to cure by moxa, but who afterwards died of other diseases, I have also remarked that the investing ligaments or periosteum of the vertebræ, did not assist in the cicatrisation of the carious portions of these vertebræ. It takes place beneath these fibrous membranes, and by the proper vessels of the bones, which develop themselves and endeavour to unite. The vertebræ themselves are pressed down, so as to favour this communication and union.\*

The growth of the teeth in all animals is completed on the outside of the alveolar processes; in many animals, as the elephant, they contract a mutual adhesion at the points in immediate contact, after they have passed out from these bony cavities; when fractured at their roots, they unite like the other bones. The callus in them presents the same phenomena and is formed according to the same laws; for the teeth, as well as the patella and neck of the femur, are destitute of periosteum, as it is observed in the other parts of the osseous

\* See the memoir on Rachialgia in my Campaigns, vol. iv.



system. A very thin cellular tissue envelopes the roots of the teeth, and separates them from the alveolar processes.

If, on the contrary, the vessels of the bone are affected by any specific morbid cause, however sound may be the state of the periosteum, no reunion will take place in fractured bones. Again, though the periosteum of old, does not essentially differ from that of young persons, the callus in fractures occurring at this time of life is formed with great difficulty, and does not take place until a considerable time has elapsed; because the texture of the bones being much more dense and compact, the vessels which form the callus are developed very slowly. It is undoubtedly here that the osseous ferrule, of the partisans of the ossification of the periosteum, would manifest itself, if it ever took place.

Every thing proves then contrary, to the opinion generally established and recently maintained in some very respectable works, that the union and restoration of bone is not, nor cannot be made by any but the proper vessels of the injured osseous pieces; and not by the membranes which envelope, or line them internally, nor by other intermediate substance. As it is by the same mechanism, (the interposition of certain substances,)

that the same anatomists explain the formation of the cicatrix in wounds of the soft parts, I will observe, in passing, that this cicatrix is made in the same manner as the union of bones; for without the development and mutual adhesion of the vessels of the divided parts, we could not expect to have any reunion or cicatrix. This destroys entirely the idea of the pretended reunion of parts totally separated from the rest of the living body; and demonstrates the error of those who think these cicatrices are made, as I have before remarked, by means of an intermediate glutinous substance, poured out by the vessels of the lips of the wound. Besides, the vessels of these cicatrices may be exhibited and injected as in united bones, and with much greater facility.

Returning once more to fractures of the neck of the femur, I will observe, that the true means of promoting the intentions of nature for the perfect union of the bony fragments, is to fix immovably the wounded limb in a suitable apparatus, and to inform the patient of the position in which it should be kept, during the time necessary for its union; from sixty to ninety-five days, according to the age of the patient, and other circumstances.

This apparatus consists of compresses, which are preferable to splints; of one or more eighteen

tail bandages; of bags of oat chaff, of various forms and sizes; of two cushions of straw, and a cloth to roll over them, and several other pieces, which it is unnecessary to mention.

While the limb is held by an assistant in a proper position, we apply at first the compresses, soaked in some repercussive fluid, as camphorated wine or vinegar, mixed with the white of an egg; the eighteen tailed bandage is next applied, so as to fold one upon the other; lastly, we terminate the dressing with the cushions rolled in their retaining cloth; a strong girdle should be attached to the superior extremity of the external cushion, and passed around the pelvis. Instead of a wooden sole, we pass under the sole of the foot a stirrup, made with a double piece of linen of a suitable length and size, to keep the foot in a state of permanent flexion. This stirrup ought to be fixed by means of strong pins upon the two cushions, after being crossed over the instep. This apparatus being applied, we leave the patient in a state of repose, and the limb in the position in which it has been placed, as long as may be judged proper. The apparatus should not be removed until the swelling, which is observed at first, is dissipated. It is important, however, to avoid changing the dressings, as much as possible.

after the twentieth day, because at this time the inflammatory process for uniting the bone commences. After the first twenty-four hours, it is no longer necessary to wet the apparatus.

This apparatus, more difficult to describe than apply, I have constantly found possessed of great advantages. The first pieces which compose it, when placed uniformly upon the surface of the fractured limb, after coaptation, exert a steady, moderate, and uniform compression over the muscles, so as to overcome their action; for, without this, we have no reason to apprehend a displacement; these pieces keep the fragments in their relative position as well as splints, without the inconveniences which attend their application. By the assistance of this apparatus, we can retain perfectly oblique fractures, even when the fragments ride over each other; of course this can be much more readily done when they are transverse, whether in simple or compound fractures. I have never found it necessary to have recourse to mechanical means for producing permanent extension, the objections to which have been exposed above. Indeed, none of the pieces of this apparatus will be found to cause irritation, or exert upon the limb a tedious or painful compression; neither have the patients whom I have treated in

this manner, had traumatic fever, even for a moment. This apparatus also unites to a great degree of simplicity, such a degree of solidity, that I have caused a great number of persons with fractures of the thigh and leg, dressed in this manner, to be carried in badly hung carriages to considerable distances, without displacement of the fractured bones, and without the patients having experienced serious inconvenience.\*

Finally, experience has proved to me that this apparatus, which is purely retentive, fulfils best the indications in these cases. It keeps the fragments in contact, favours the formation of callus, and preserves the limb perfectly immoveable and straight.

The apparatus for fractures of the superior extremities is more simple; a pasteboard under the arm, with a bandage, is the chief; a scarf to suspend the forearm, and a pyramidal cushion

\* I have shown to the Academy of Medicine a person named Justice (Dominique,) a *canonier* in the *ex-guard*, at present in the Royal Hotel of the Invalides. This soldier, who had his right thigh fractured by a gunshot wound, in 1809 at the battle of Ratisbon, had an artificial joint formed in the body of the femur, and an ulcer of the heel of the same side, with a shortening of about six inches. The two fragments separated from each other and rounded at their extremity, could be perfectly distinguished through the thick fleshy part of this limb. This distressing infirmity was the result of the application of the apparatus for permanent extension, employed for this case in one of the army hospitals.

fixed by a bandage to the body, to give a uniform support to the limb, are sufficient for either simple or compound fractures of the clavicle or arm. In the first, it is necessary that the scarf embrace the whole arm, carrying the elbow a little backwards, by means of regular folds in the scarf, fixed by a few stitches. Those of the forearm are preserved by a similar apparatus; in all cases splints are either injurious or useless.

The last person for whom I employed the apparatus which I have thus described, is lieutenant general, the Baron Fririon. This general officer, aged about fifty-five years, fractured the neck of the femur of the right side, by falling violently at his full length, on the first of November, 1819. The fracture being very evident, and acknowledged by the medical men called in, I hastened to prepare the apparatus, and to apply it, having preceded it by the application of cupping with scarification over the bruised and painful parts of the thigh; a very useful precaution.

The operation for this fracture, if well performed, is long and difficult, because all the pieces of the apparatus should be applied with perfect accuracy and uniformity. General Fririon endured it without pain, and without a quarter of an hour of fever. The apparatus was not



renewed but once before the twentieth day, and was entirely removed on the seventy-fifth day after the accident. The limb was found in its proper situation without any deformity, and without the least excoriation; it was only shortened about three lines. In the fourth month, the general began to walk with crutches; he now walks with the greatest ease, and without limping; the limb has recovered its primitive plumpness and form; indeed the cure may be considered perfect.

## ESSAY VI.

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### ON WOUNDS OF THE BLADDER,

AND UPON CERTAIN FOREIGN BODIES REMAINING IN THAT VISCUS.\*

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THE ancients considered wounds of the bladder mortal; this opinion is expressed in one of the aphorisms of Hippocrates; *cui persecta vesica, lethale*. Although wounds have since become more complicated, from the invention of fire arms, surgery, by the progress which it has made in the operation of lithotomy and in the treatment of wounds of this organ, has proved that this aphorism is not always true. Nevertheless, the subject has not been very fully treated by authors. The Chirurgical Nosography of Richerand, one of our most modern and learned works, has made no men-

\* The three first volumes of the "Campaigns" of Baron Larry, were translated and published by Professor Hall, of the University of Maryland, in 1815. A fourth volume, containing the Campaigns of Moscow, &c. has since been published in Paris, but is not translated. The first part of the following essay is taken from this volume, which Professor Hall had the kindness to loan to me.—*Trans.*

tion of it. Those authors who have written on the subject, say but little respecting the diagnostic signs, or the course which it is most proper to pursue to remove the immediate effects, and to obviate those which may accompany these lesions; especially when they are complicated with the presence of foreign bodies in the bladder; which is the principal object of the present essay.

If the bladder be empty, it is very secure from the wound of a pointed instrument, or a ball passing through the diameter of the pelvis; at any rate this accident very rarely happens. But it is considerably exposed when distended by urine, which is for the most part the case with combatants. The excitement of battle and the long time during which the mind is drawn away from trifling impressions, allow the urine to accumulate in the bladder and to fill the pelvis, so that no wounding cause can enter this circle of bones without wounding this viscus.

In this essay, I propose to trace the phenomena which accompany punctured, incised, and gunshot wounds of the bladder.

Punctured or incised wounds of the bladder, such as are made by swords, bayonets, lances, &c. may pierce the bladder at some point of its circumference, or pass through where its parietes are

covered by the peritoneum. In this last case, the wounds are generally mortal. However prompt the contraction, in this case, the urine escapes through the wound corresponding to the cavity of the abdomen, spreads through it and produces immediately a fatal inflammation. I have dressed on the field of battle many soldiers in whom the bladder had been thus pierced, and they have all died within the first forty-eight hours, of inflammation and gangrene. But, if the instrument pierce this sack at one of the points not covered by the peritoneum, the wound is susceptible of cure, unless the internal hæmorrhage be too great. The most certain symptom of this injury is the discharge of urine from the wound. The discharge may be momentary, intermittent or continued; according to the situation of the wounded person, or the changes which take place in the bladder. The urine will appear at the moment the wound is made when the bladder, being very full, is pierced at its superior part; after the urine is discharged the edges of the wound will contract and come in contact and form an adhesion; especially if the urine be readily evacuated by the natural passages. Should there be any obstacle to the passage of the urine existing in the urethra, the bladder will then become filled and distended so as to open anew

the lips of the wound and suffer the urine to escape. The same accident might take place, if after having passed a gum elastic catheter it were removed too soon; another introduction of the instrument would prevent the urine from escaping through the wound and restore it to its natural course. Finally, its emission will be permanent, and perhaps continue for a considerable time, if the wound occur at one of the most depending parts of the bladder.

When the course of these wounds is extensive and not direct, abscesses are often formed at the different parts where the urine has escaped. These abscesses should be opened immediately, and an elastic gum catheter introduced into the urethra; one of the most important circumstances to be observed in the treatment of all wounds of the bladder. Warm baths, camphorated oily embrocations to the abdomen, cooling antispasmodics, frequent enemata, cupping with scarification about the wound, and bleeding, may each be occasionally employed with advantage, in persons suffering from punctured or incised wounds of this organ. I will relate here a summary of two cases which appear to me to be interesting.

Joseph Perrier, a chasseur in the *ex-guard*, being on horseback in a charge of cavalry, was

wounded in the right thigh by the lance of a Cossac. This weapon, after having pierced the skin and fascia-lata on the upper and outside of the limb, passed obliquely from below, upwards and inwards, through the inguinal glands towards the crural arch, under which the point of the weapon glided, inwards and backwards, some distance from the *symphysis pubis*. That part of the anterior wall of the bladder which is uncovered by the peritoneum was opened by the lance; the urine escaped immediately through the wound. Soon afterwards, the patient discharged a large quantity of urine mixed with blood through the natural passages. After this hæmorrhage a perfect calm succeeded, the urine was no longer discharged through the wound and the patient considered himself cured.

The bladder, in this case, being relieved from the urine the edges of the wound were brought in contact, and contracted an adhesion; subsequently suppuration took place, an abscess was formed in the course of the wound, which opened spontaneously, suffering a quantity of urine and pus to escape. This wound remained for a long time fistulous. Nevertheless, by the aid of a catheter introduced into the urethra, a counter opening in the groin, suitable dressings, and the assiduous



attentions of M. Champion, one of my pupils, he was cured.

*Case 2d.*—In a bull fight which we saw at Burgos, on our entrance into Spain in 1808, a soldier, who was intoxicated, wished, in imitation of *los torreros*, to set at defiance and fight with the bull in the arena. The furious animal dashed upon the unfortunate soldier, who, in endeavouring to avoid him, fell to the ground; he was immediately empaled on one of the horns of the bull, and thrown violently a considerable distance backwards. A universal cry was uttered by the audience, at the same moment one of the intrepid combatants leaped upon the animal, pierced him with his sword, and killed him instantly. I immediately sprang over the barrier and ran to the assistance of the soldier, who lay senseless upon the arena. I had him transported directly to the hospital, to which I attended him and made the first dressing.

I found a lacerated wound about an inch and a half long on the upper part of the right thigh, passing obliquely from behind forwards, and a little outwards, towards the groin of the same side. On a further examination, I found that the very sharp and curved horn, after having lacerated the inguinal glands, had passed under the crural arch,

and buried itself in the pelvis, where its extremity had met with the bladder distended with urine. It was not pierced, but was no doubt denuded of its cellular membrane, and weakened at this point, for a portion of this membranous sack, formed a hernia under the crural arch, so as to present a tumour of the size of a pullet's egg. There was at first a considerable hæmorrhage, no doubt from some of the branches of the crural artery, which the horn had lacerated in its course through the deep-seated parts of the groin. The patient was cold, his countenance discoloured, and the pulse very small; he was affected with great anxiety and ischuria. I caused him to drink a little strong coffee, in order to diminish the intoxication and restore the vital powers. This was followed by copious vomiting, which relieved the patient; the greatest source of distress then remaining was the frequent desire to pass urine.

I dilated the wound internally, and passed a sound, so as to detach that part of the tegument of the groin which covered the herniary tumour, (*cystocele*) and then cut upon the most projecting part of the skin, so as to lay bare the whole tumour. Before attempting its reduction, I took the precaution of introducing into the bladder an elastic gum catheter, by which the organ was

emptied; the instrument was allowed to remain. I afterwards reduced the displaced part of this membranous sack; causing the urine to return gradually into its proper cavity. The system became immediately soothed, and we conceived great hopes of our patient. The wound was then brought together and carefully dressed with lint, and the whole supported by a retentive bandage. Suitable remedies were prescribed, and particular directions given that the catheter should not be removed until the cicatrisation of the wound in the groin, lest a return of the hernia should occur. On my return from Madrid, I found this man perfectly cured.

Although the bladder was not penetrated, it was nevertheless injured, and, without prompt assistance, it is probable that the portion of the bladder in which the urine was retained, would have been perforated in consequence of the strangulation, and the life of the patient exposed.

I will now endeavour to explain the effects of injuries of this viscus from gunshot wounds, in which the foreign body has either passed through or remains in its cavity; and I will then point out the method, which experience has proved to me to be the best for extracting the foreign body.—If the ball, after entering the bladder, still preserve

its momentum, it will pass through the opposite side, and either escape externally, or bury itself in the surrounding parts. In this case, the urine will escape immediately, mixed with blood, by one or both wounds. There will be a diminution, or total suppression of urine by the unethra; the patient will pass more or less blood through this passage; he will experience severe and permanent pains in the direction of the wound; there will be frequent and painful attempts to urinate with nausea, and sometimes vomiting; extreme anxiety and restlessness; paleness of the countenance; spasmodic state of the pulse; and the patient will often moan, or utter plaintive cries. In entering or passing out, the ball may have injured the rectum; the urine will then enter into this intestine, and, mixed with its contents, pass out through the wound, when there will not remain any doubt of the double lesion of these organs.

Should the bladder be perforated at a point corresponding with the cavity of the abdomen; as for example, where it is covered on its posterior part by the peritoneum, the urine generally extravasates into this cavity, causing an inflammation of that membrane. This spreads rapidly over all the viscera, producing pain, oppression, internal heat, stupor, gangrene, and death; which seize at

the same time the organs of animal life, and those of internal life. The first are affected by a sort of *metastasis*, by which the urinous principle is thrown upon the brain. The particular odour, which denotes the presence of this volatile substance, manifests itself over the whole system in the cutaneous transpiration.

These are the sort of wounds mentioned by Hippocrates, Aristotle, and Galen, when made by cutting instruments. But when they are made in any other part of the bladder than that covered by the peritoneum, so that no communication is formed with the peritoneal cavity, the wounds, as we have already said, are curable. Although the urine may pass immediately by the wound, it is rare that it infiltrates, at first, into the cellular membrane in the direction of the wound; because its edges and walls become engorged and swollen from the contact of the ball, and thus oppose the passage of this fluid. When the eschars are detached, it again flows through the wounds, and it may then penetrate the cellular membrane and cause serious accidents. These effects may be prevented by keeping in the urethra a gum elastic catheter; but its introduction is not always easy; as for example, when it encounters splinters of

bone in the canal, or when the inflammation has extended to the neck of the bladder.

It often happens that, from the laceration of the arterial branches or varicose veins of this membranous sack, an effusion of blood into its cavity takes place; from which there arises a deep seated irritation, accompanied with heat and inflammation. We may recognize this internal hæmorrhage by the symptoms of retention, and inflammation, by the smallness of the pulse, the paleness of the face, and the dryness of the wounds. It is rare that the blood coagulates in the bladder, from its mixture with the urine, it may therefore be easily evacuated through catheter. In such cases, warm, emollient, and anodyne injections, will be found beneficial. These accidents become complicated with wounds of the bladder, and render their treatment difficult.

In every case, it is proper to dilate freely the wound at which the ball has entered and passed out; taking care, of course, not to wound important parts. This will be found to prevent engorgement and inflammation, which usually supervene when this precaution is neglected. By unloading the vessels, it has the effect of local bleeding; an effect much more salutary than can be obtained from opening one of the veins of the arm or leg;



the eschars are detached more easily, and are readily expelled, and the cicatrisation will, of course, be more rapid and exact. A pledget of lint over each wound, some compresses, and a retentive bandage, form the first dressing. It is necessary to subject the patient to a cooling, mucilaginous regimen, to prescribe emollient enemata, vapour baths, and embrocations of camphorated oil of chamomile over the abdomen.

The symptoms, for the first three or four days, are generally violent; during this first period, which is that of inflammation, it is not necessary to sound the patient, or examine the wound carefully; it is better to wait a little, until suppuration has taken place. When the eschars begin to separate, the gum elastic catheter should be immediately introduced through the urethra into the bladder, so as to prevent urinous infiltration and its consequences, and to accelerate the cicatrisation of the wounds. This course contributed much to the cure of several soldiers attached to the army of Egypt, who had received wounds of the bladder. I have collected several of these cases, which were inserted in the second volume of my Campaigns. The most remarkable instance of this kind is that of a subaltern officer, in whom

the ball had traversed both the bladder and rectum; who recovered entirely.

I will give here a summary of a case, very analogous to this, which occurred to me during the campaign of 1813, in the person of the *Sieur Burnot*, lieutenant in the twenty-sixth regiment of light infantry. This officer was wounded in the battle of Hanau, on the thirtieth of October, by a musket ball, which traversed the scrotum, dividing the right spermatic cord, and penetrated obliquely through the lower part of the pubis, near the symphysis, touched the urethra, entered into the bladder, passed through its *bas-fond*, posteriorly towards the left side, perforated the rectum through both its walls, and finally passed out at the upper part of the thigh, about an inch from the margin of the *anus*. The discharge of urine and stercoraceous matter by the wound and intestine, left no reason to doubt the double injury. The patient was carried to the hospital at Mayence, where I had occasion to follow him and direct his treatment. The little urine that had escaped by the wound of the scrotum, was sufficient to destroy the vitality of the cellular tissue of these parts. The extirpation of the testicle, which the rupture of the cord had also deprived of life, and deep scarifications, stopped the progress of the

gangrene. After the eschars were detached, all the unpleasant symptoms ceased; and the patient, who until then had but little cause for hope, found himself out of danger. I kept an elastic gum catheter in the urethra and bladder, prescribing emollient enemata and a suitable regimen. The urine and stercoraceous matter passed for some time through the posterior wound; and, at different periods in the progress of the cure, small bony fragments, the evulsion of which had been accompanied with profuse hæmorrhage, passed by the urethra. The wound of the scrotum cicatrised first, but that of the thigh remained for a long time fistulous, during which the patient was tormented by an almost continual discharge of stercoraceous matter, mixed with urine. The catheter was constantly used, which evidently favoured the cicatrisation of the wounds of the bladder, and the discharge of the foreign bodies. The attending surgeon, M. Dugat, frequently found small bony fragments in the eye of the catheter. At the end of two months, this officer was completely cured.

M. Bastier, surgeon-major of a battalion of service in Italy, has sent me a translation from the German Gazette of Saltzburgh for the year 1812, a case analogous to the one I have just related.

“The ball entered by the pubis and passed out through the sacrum. The urine and fecal matter passed out through the posterior wound, but the urine only escaped through the anterior wound. The inferior extremities were in a state of paralysis; but the patient was cured, notwithstanding all these unfavourable circumstances.”

The following case, extracted from the Memoirs of the Academy of Sciences, year 1725, proves that gun shot wounds of the bladder may be accompanied with dangerous hæmorrhage.

A mason of Lausanne, about twenty-five years of age, received a gun-shot wound in the abdomen, in 1724. The ball, which weighed an ounce, entered the left side of the abdomen, about an inch above the pubis and two fingers breadth from the *linea alba*, piercing the *rectus* muscle, the epigastric artery, the fundus of the bladder, and the *os sacrum* on its left side, and finally passed out three fingers breadth above the anus. The tunics of the spermatic vessels on the left side were wounded which caused an inflammation in the testicle and scrotum. The laceration of the bladder was considerable; the urine was only discharged through the wound; the rectum not being injured.”

The patient suffered severely from hæmorrhage during the first few days. It appeared that the blood accumulated in the bladder producing the alarming symptoms which ordinarily accompany these hæmorrhages; *insomnia*, delirium, ardent thirst, retention of urine, tension of the abdomen, &c. In a word the patient was in a most alarming situation.

“After having unsuccessfully had recourse to various means, M. Martin, his physician, threw emollient injections into the bladder. He thought that they favoured the dilatation of the wound of this viscus, and facilitated the discharge of the blood and urine through them and the urethra. From this time the alarming symptoms disappeared, and the patient got well.”

In reading this case, it is difficult, to determine whether the detention of the blood and urine arose from the introduction of the catheter before the injections were employed, or whether the favourable change, which so suddenly occurred in this patient, arose from the employment of the injections; a remedy always advantageous when employed with discrimination. I will not undertake to resolve these questions.

How can we explain the fact that a foreign body may perforate the bladder at one of its

points and remain in its cavity?—We may easily conceive that a fragment of bone, a small piece of money, a button, or any other thin flat body detached by the ball, and projected before it into the bladder, after having pierced its walls, by one of its angles or edges, may be turned upon its axis by the impulse which it has received, and by the mass of fluid which it traverses, so as to present to the other wall its largest surface; and thus stop and fall into the cavity of the bladder. But with respect to balls, when the lead has preserved its spherical form, how can they be stopped by this membranous sack without passing entirely through?—Must we not suppose that their passage through the hard or soft walls of the pelvis has retarded their motion; so that when they arrive in the cavity of the bladder, the quantity of urine contained in it prevents their further progress?

When the balls of lead are very small, these bodies may be spontaneously expelled through the urethra, or through the passage by which they have entered, by artificial means. The example of a captain, cited in Theophilus Bonnet, is one of the most remarkable.

“This officer had received a pistol shot in the right side of the abdomen, and the ball had pene-



trated into the bladder. The wound closed and cicatrised and the patient was cured; but, after some time, severe pains occurred, similar to those produced by the presence of a calculus in the bladder; and, after great efforts, a small ball of lead of the size of a pea, was voided through the urethra."

Small grains of this metal will also be readily expelled by means of an elastic gum catheter, which will favour their discharge. They may be gradually increased until the largest sized instrument is employed. These foreign bodies may thus either pass through the urethra or get entangled in the eyes of the instrument. I have given great relief to several persons affected with gravel in this way; calculi of considerable volume may thus pass either through the canal or the instrument.

According to Prosper Alpinus, the Egyptians in his time were in the habit of extracting urinary calculi without an incision, by means of a dilating instrument.\* It is probable that this was done when the calculus was small, which no doubt may be done with advantage in the female. But the modern Egyptians are unacquainted with this art. The disease of the stone must be rare among this

\* Vide chapter xiv.

people, as, during my campaign in that country, it was not spoken of.

What consequences will arise if the ball be allowed to remain in the bladder?—The effects will be injurious, if the foreign body be large and irregular; it will soon produce an inflammation proportioned to its weight, mass, the nature of the substance and its form. Ulceration, suppuration and perforation of the bladder will succeed; the foreign body will pass into the cellular tissue of the pelvis, and with it the urine will infiltrate, producing in its course gangrene and death. This termination has been undoubtedly the most common in the army. Under some very peculiarly favorable circumstances, the ball may gain the perineum, produce a gangrenous abscess, which may open, either naturally or artificially, and the ball escape; it may also pass by the rectum in a similar manner.

If the foreign body be small, and with a smooth surface, the bladder will not be so much affected by it; its surface will soon be covered with earthy matter, deposited by the urine. New laminae will be in succession formed, and it will thus be the *nucleus* of a calculus, which will continue to increase. The symptoms which announce its

presence in the bladder, will be the same as those which indicate the existence of a calculus. But it is more difficult to recognise cases in which the ball is naked, or without an envelop. The pains are, undoubtedly, more vivid—because the metallic substance, in immediate contact with the mucous membrane of the bladder, causes an irritation more painful than what is produced by the presence of a calcarious substance. The almost continual spasmodic contraction of the bladder conceals the ball in its *bas fond*, so that it is almost impossible to detect it; it may also be covered by a layer of blood, albumen, a piece of linen or wadding, or even a portion of a thin membranous pellicle; so that the sound or catheter may touch it without producing any sensible shock. Nevertheless, an experienced hand should be able to recognise it; it is sufficient to direct the extremity of the sound towards the *bas fond* of the bladder, and, with the assistance of the finger introduced into the rectum, the ball may be so raised up that the instrument can touch it; besides, it will be felt projecting towards this intestine. Lastly, the patient may be made to execute different motions, during which he will perceive the bullet to be rolling about. These, together with the symptoms which characterize a gun-shot wound of the lower belly

or pelvis, without the discharge of the ball, should confirm our opinion of the existence of a foreign body in this viscus.

Taking for granted that this foreign body is lead, ought we, before performing an operation, to attempt to dissolve it by means of quicksilver, as some authors advise; because, when these two substances are brought in contact, in certain proportions, the lead becomes dissolved, forming a liquid amalgam, which may be discharged through the urethra?

The experiments of Ledran, the most zealous partisan of this method, admit of some doubts as to their accuracy and fidelity. Experiments of this nature are, besides, difficult to execute, and those of Ledran, having for their object only the extraction of a small portion of a lead catheter, weighing about two drams, cannot serve as a rule for attempting the solution of a musket ball, weighing at least an ounce. But, supposing that the musket ball could be dissolved in the bladder, are we sure of finding it naked, even immediately after the accident?—Certainly not; on the contrary we are almost sure, during the first twenty-four hours, to find it covered either by coagulated blood, or, perhaps, by a portion of mucous membrane, which it has detached from the walls of

the bladder in its course. Finally, it is quite possible that it may be iron or brass, &c. instead of lead. The ball may also have carried along with it portions of the bones or clothes, the presence of which in the bladder will be as pernicious as this projectile itself. In all these cases, injections of quicksilver will be useless; and by increasing the quantity and weight of foreign substances in the bladder, it will become injurious, aggravating all the symptoms.—This remedy should then be rejected in such cases.

We have already spoken of the course necessary to be pursued for the extraction of grains of lead, or other small foreign substances; but when these bodies are too large to pass through the urethra, it then becomes necessary to make an opening for their discharge. Let us next inquire what is the safest and most desirable method of doing this.—Shall we take the opening by which the ball has penetrated, supposing this to be at some point of the belly corresponding with the bladder? Many authors, and among them some very celebrated surgeons, have approved of this: I shall avoid citing them, as this would be unnecessary in forming an opinion of the propriety of the following reflections.

Whatever may be the direction that the external wound has taken, from the course of the ball, it is almost impossible that it should be found in a direct line with that of the bladder; so that the surgeon can conduct an instrument from the one to the other, to seek the ball at the bottom of this viscus.—*First.* Because the directness of the line, leading from the one to the other, must cease, the moment the urine is evacuated; as the cavity of this sack entirely disappears from the contraction of its walls; and it is thus removed from the external wound. *Second.* Because both the external and internal wound retract and close, almost entirely, from the contraction and retractility of the parts, which render all researches difficult and fruitless. Even if we should dilate the external wound, and thus succeed in finding the opening into the bladder, it would be necessary to enlarge it, so as to be able to introduce the forceps. This enlargement of the wound would be dangerous, especially if inflammation had taken place, or if we should happen to divide any of the larger vessels ramifying upon the walls of this organ; this dilatation would also facilitate the infiltration of the urine into the cellular membrane of the pelvis.

Besides, after having extracted the ball in this way, supposing all the circumstances favourable



to its accomplishment, if a portion of the clothing, or other body which yields readily to the touch, should remain in the bladder, it would serve as the nucleus to a calculus; for which it would be equally necessary to perform the operation of lithotomy at some subsequent period, and the patient would have thus to suffer two operations.—By making a counter opening at a depending part of this sack, we may prevent all the inconveniences of which I have spoken, and have the double advantage of facilitating the extraction of all the foreign bodies, and the cicatrisation of the gunshot wound of the bladder.

I propose then, as the means most simple and sure, the sub pubic and lateral operation of lithotomy; which I usually perform with a bistoury, a sound and forceps. This process, in which I have always succeeded, is rarely accompanied with accidents. A slight hæmorrhage from the transverse artery of the perineum sometimes supervenes; but this may be readily stopped by tying the vessel. To obtain from this operation all the benefits that we may desire, it is necessary to perform it before the foreign body, which renders it necessary, has altered the state of the bladder; and as wounds of this viscus are often accompanied with severe inflammation, it is necessary to have recourse to

the operation either before this has taken place, or after it has terminated.

A single fact, of which I am now about to retrace succinctly the history, shews that this operation has been practised, with the intention of extracting a ball concealed in the bladder. Still this did not take place until long after the accident; while my operation, of which I shall give an account after having related a summary of the first case, was performed a few days after the accident.

*Case 1st.*—"A German soldier received a gunshot wound, at about twenty paces, in the year 1800. The ball perforated the sacrum, at about the junction of the third or fourth false vertebra, passed through the rectum, and penetrated into the bladder. The wound cicatrised at the end of four weeks. The patient, during this time, complained of severe pains in the pelvis, and observed the sensation of something round rolling in the bladder, when the position of the body was changed. The pains continued after the cure, but he lost by degrees the sensation he had at first experienced of the presence of a foreign body. Ten years afterwards, the physicians of the hospital of Wertheim perceived that there was a hard body on the side of the neck of the bladder. The opera-

tion of lithotomy was performed with success by Langenbeck, when a calculus, of the size of a small hen's egg, was found to conceal the ball, which was of the common size."

The following is a summary of a case which occurred to myself. In passing through the wards of the large hospital at Witepsk, in Russia, on the thirtieth of August, 1812, I was stopped by the distressing cries of a wounded officer, M. Guenou, lieutenant in the ninety second regiment of the line. I went immediately to him, and examined him with care. He had received a gunshot wound on the internal and superior part of the right groin, passing obliquely inwards, towards the cavity of the pelvis. The careful introduction of a large probe shewed an excavation of the pubis, and, from the direction followed by the probe, that there was a lesion of the bladder. This, indeed, was not equivocal; for, though the external wound was surrounded by a blackish eschar, it suffered bloody urine to exude. The patient experienced in the region of the bladder exceedingly severe and permanent pains, with a continual desire to pass the urine. The urine, mixed with blood, ran in a small interrupted stream, which caused the patient to utter the most piercing cries. His pulse was nervous and febrile, and heat

with thirst were beginning to manifest themselves; but, the paleness of the countenance remained, and the voice was hoarse and interrupted. Deprived of sleep since the occurrence of the accident, this officer was in a state of extreme anxiety. When he moved, either to the right or left, he perceived a sensation as if something were rolling within him.

I was informed by him that these symptoms were the result of a gun-shot wound, which he had received at the battle of Witepsk, on the 30th of July, at the distance of about seventy paces, and that the ball had not passed out. These circumstances induced me to suppose that the ball, which had produced the wound in the groin, had stopped in the bladder; and, to satisfy myself on this point, I sounded the patient. I had some difficulty in detecting the foreign body, but at last perceived that the sound touched some foreign substance, though the shock was scarcely perceptible. Before proceeding to the operation of lithotomy, which I conceived indispensable and urgent, I wished to have my opinion confirmed by a consultation; which was accordingly convened on the following morning, the 4th of August. My friend, Dr. Ribes was one of the persons consulted. The necessity of the operation was admitted, and it was

determined that it should be performed immediately. After every arrangement was made, the operation was performed in less than two minutes, and the ball, (which I have deposited in the cabinet of the School of Medicine) presented to the patient. It was encrusted with a small portion of bone; and one of its sides covered by a layer of blood. This would have been sufficient to render useless the injection of quicksilver, which was proposed at the consultation. The extraction of the ball was followed by the discharge of a small fragment of bone, a piece of cloth, and some coagulated blood; and afterwards two emollient injections were thrown into the bladder. Lint with compresses and a bandage were then applied over the wound. The patient was placed in a convenient situation and a suitable regimen prescribed. With the exception of a slight hæmorrhage, which took place next day, and which I readily stopped, no accident occurred. Some fever manifested itself on the third day, the suppuration took place, the wound became cleansed, and, on the seventh day, the urine was discharged through the natural passages. Cicatrisation soon took place; and, on the thirty-second day of the operation, M. Guenou left the hospital, perfectly cured, to rejoin his regiment. He wrote to me from Moscow to thank



me, and to request me to obtain for him the decoration of the legion of honor; which was accordingly procured.

A sergeant major in the twentieth regiment of the line, who had received a slight wound in the left leg, was lying in the same ward in which I operated upon M. Guenou. Encouraged by the instantaneous success of the operation upon his companion, he desired me to operate upon him; assuring me that he had suffered for twenty years, from a stone in the bladder; which could not be detected either at Metz, Mezieres, or Besancon; where he had been in garrison with his regiment at different periods.

I immediately sounded him, and, with little difficulty, I became satisfied that he was correct. On consultation, the calculus was recognised and the necessity of the operation admitted; the operation was performed by myself, in the same way as in the last case. I had some difficulty in seizing the stone with the forceps. It appeared to me to be enveloped in a kind of membranous pellicle, which had, no doubt, deceived the other practitioners who had examined him. However, the extraction was effected with sufficient promptitude, and the patient cured without any accident.

The stone having presented some peculiar and



uncommon characters, with respect to its specific gravity, colour and density, I have presented it to the Faculty of Medicine. The nucleus consisted of several grains of a ferruginous aspect.\*

In speaking of gunshot wounds penetrating the bladder from above, I have only spoken of two sorts of solutions of continuity in this viscus. The one in which the projectile perforates one of the walls of the organ and falls into its cavity, where it remains until removed by art or nature; the other affecting both walls, in which the projectile passes through the organ, and is lost in the substance of the adjoining parts, or passes out entirely. But when the above observations were written, I was far from supposing that a projectile, the force of which was weakened by passing through a mass of living flesh, could lacerate the walls of the bladder in such a manner, that a portion of the sphere should penetrate its walls without falling into the cavity. But the facts which I am now about to relate, show the possibility of such an event. Before describing these cases, I will endeavour to give some explanation of the phenomenon.

\* This essay on wounds of the bladder was published thus far, in the fourth volume of the "Campaigns" in 1817. The remaining part is taken from the *Bulletins de la Societe Medicale D'Emulation*, November, 1822.

We may suppose that the ball, after having pursued a course more or less tortuous, is stopped at one of the cellular or fibrous points of the external surface of the bladder, so as to touch its tunics. The presence of a foreign body soon induces an inflammation in the surrounding parts, which encircles a great part of the circumference of the ball, forming a sort of cyst, which envelopes it, and prevents its moving from the place it occupies. At the same time, that point of the bladder in contact with the ball, after having undergone the process of inflammation and suppuration, finishes by perforating the wall of the sack, by the process of ulceration. The ball becomes thus a part of the cavity, and this metallic point, being constantly wet by the urine, has the earthy matter deposited upon its surface, augmenting the weight of the projectile, until it falls at last entirely into the cavity of the bladder. Or nature, which always tends to overcome all obstacles, and to establish the equilibrium of the functions, may, by a spontaneous effort, separate the foreign body from an organ so important, and the opening thus made in the bladder may close, or cicatrise. The projectile will be displaced the more easily, as the suppuration extends itself most readily from the exterior of the bladder, to those

parts where it finds the least resistance. It may afterwards remain at a certain distance from the bladder, and manifest itself beneath the integuments; from which it will be easy to extract it.

These are the two courses which the ball may follow, when it is retarded by the thickness of the parts contiguous to the bladder. It is to the elasticity, and contractility of the tissues which surround these foreign bodies, and to the inflammation of these tissues, to which we must refer these singular phenomena. It is thus that we may explain the different periods that may elapse, without the patient experiencing any violent pain, between receiving the wound, and the time when the foreign body falls into the cavity of the bladder. We may also understand the intermission which sometimes takes place in the pain, produced by the emission of urine through the wound, when the ball, after having communicated with the cavity of the bladder, is expelled to a distance from its walls, so that the opening which had existed in them, becomes closed up and cicatrised. I will now relate two facts in support of the explanation which has just been given.

I inserted the first in the *Bulletin de la Societe Medicale d'Emulation* in the year 1821. It was

furnished by M. Souberbielle; I have seen and interrogated the subject of the case. The patient was a soldier in the 135th regiment of the line, named Dapret, who had received, on the memorable second of May, 1813, near Halle, a gunshot wound in the left flank, which passed obliquely over the false ribs, which were cut deeply, into the groin of the same side, and a little behind the pubis. The wound was dressed methodically, but no projectile found. After the first symptoms, which occur in all gunshot wounds, the patient was apparently cured, and returned to his usual occupations for two or three years without feeling pain or other inconvenience. But, at the end of the year 1815, a tumour, accompanied with fever and other local inflammatory symptoms, occurred above and behind the horizontal branch of the pubis, near the wound, at the bottom of which the patient perceived, some weeks afterwards, a sense of tearing, which was immediately followed by an urgent desire to pass his urine, and a diminution of the tumour. A large quantity of blood and purulent matter was discharged with the urine. The blood disappeared in a few days, but the pus continued to pass out with the urine for some time.

From this time until the commencement of the year 1821, the patient experienced a sense of heaviness and pains in the region of the tumour. At this time a skilful surgeon sounded him, and thought he recognised a calculus in the bladder; but at the moment when every thing was arranged for the operation, the foreign body could not be found. Other surgeons having also sounded the patient, were equally unsuccessful. Notwithstanding the symptoms of which we have spoken, the patient, according to his own acknowledgment, continued to apply himself in his usual occupations until the month of June, 1821, when, after rather violent exercise, he was attacked with all the symptoms which characterize the presence of an irregular calculus in the bladder. The pains especially were extremely severe, so that he could scarcely endure them; however, he supported them until the early part of the month of August, submitting to the frightful suffering with which he was afflicted. M. Souberbielle was consulted, who, at the first introduction of the sound, recognised the foreign body which had been before remarked. Being an experienced surgeon, he at once proposed the operation of lithotomy, which the patient joyfully acceded to. This surgeon then performed the lateral operation of lithotomy,

and extracted the ball (*a biscayen*) weighing four ounces, two drams;\* one half of the sphere was covered with several laminæ of earthy matter, arranged in diverging rays, terminated by asperities. The patient was perfectly cured in a very short time.

Before making the application of this fact to the above remarks, I shall give a summary of another case analogous to it, which will go far in support of my opinion.

Mr. J. M. Remy, about fifty years of age, a captain in the 108th regiment of the line, while marching at the head of his battalion, at the unfortunate battle of Waterloo, was struck by a ball on the left hypochondriac region. The projectile, after having pierced the integuments, cut the anterior extremity of the tenth rib, and buried itself deeply; passing downwards and forwards towards the pubis in the abdominal cavity, where it was lost. This gunshot wound was immediately followed by the fall of the patient, and a free discharge of blood and stercoraceous matter from the wound. M. Remy was carried in the ambulance to Jemmapes, where he passed the eight first days without assistance, or without taking any

\* The biscayen generally weighs about four ounces; the calculous incrustation then had increased its weight two drams.



thing but a little water. From this he was transported to one of the English hospitals at Brussels, where he remained until the period of his cure; which did not take place until the end of December, in the same year. During the first few days, this officer discharged a good deal of blood by the urinary passages, and he thought that a part of the urine was discharged with the excrements by the wound. While a prisoner in Belgium, in visiting the hospitals at Brussels, I saw this patient. The stercoraceous matter still passed by the wound, but in less quantity than at first.

Towards the end of July, a tumour of considerable size manifested itself at the lower part of the right groin and towards the pubis, accompanied with darting pains, difficulty in passing the urine, and a disagreeable sense of weight. After two or three days of severe pain, there was suddenly discharged from the wound a large quantity of fluid matter, serous and purulent, having a urinous odour. The discharge was so copious that the mattress was soaked through by it. From this time the patient found relief. The discharge by the urethra of blood and pus, which had frequently occurred before, ceased entirely; and the urinary functions were entirely restored. The artificial anus gradually disappeared, and the

wound of the abdomen cicatrised. By the end of the year 1815, the patient, requiring no further medical aid, returned to France, considering himself perfectly cured. Nevertheless, he never ceased to complain of a dull pain and sense of heaviness at the lower part of the linea alba, and behind the pubis. These symptoms increasing, M. Remy consulted me on the first of October, 1821.

After having related the above circumstances, this officer informed me that he then experienced a very painful heaviness, in the spot above mentioned; which he ascribed to the presence of the ball with which he was wounded at the battle of Waterloo.

On examination, a small hard elastic tumour of an ovoid shape could be perceived, situated deeply beneath the lowest part of the linea alba. M. Remy complained of pain when this was slightly pressed. This induced me to propose making an incision, for the purpose of seeking for the projectile. But as I foresaw some difficulty in executing this operation, though apparently very simple, I called Dr. Ribes in consultation, performing it in his presence. An incision was made into the thick integuments which covered the tumour, the patient being rather fat; a cellular cyst about the size of a

hen's egg was then separated, and removed entire, by which the *linea alba* and left pyramidal muscles were laid bare, without our perceiving any trace of the projectile. However, we discovered in the *linea alba* a small opening, through which we introduced a probe, by which we discovered a hard body, situated about three centimetres deep, between the left horizontal branch of the *os pubis*, and the body of the bladder. I did not hesitate to dilate inferiorly the aponeurotic portion of this opening, to enable me to arrive more readily at the foreign body that I had discovered. But it was so closed up in the fibrous cyst which enveloped it, that it could be disengaged only by making a free incision into this cyst. The extraction was effected by means of a small pair of polypus forceps. This foreign body was found to be a ball about two ounces in weight, incrustated with a circular layer of calculus matter, having the same characters, as was observed upon the biscayen of Dapret. The patient was perfectly cured in the course of three or four weeks, and has returned home perfectly well.

*Reflections on these two cases.*

From these facts it appears probable:—*First.* That in the first patient, the *biscayen*, after having passed through a part of its parabola, from the hypochondrium through the walls of the belly, stopped behind the pubis, between the posterior surface of the horizontal branch of this bone, and the bladder. Having buried a part of its sphere in the substance of this bony portion, it remained immoveable in its position, until the formation of the tumour of which I have spoken. This tumour was an abscess, which the presence of this foreign body had induced. This abscess would necessarily detach, on the one side, that surface of the foreign body buried in the bone, and, on the other, affect the corresponding part of the coats of the bladder; which must have been perforated by the process of ulceration, and the opening which then resulted, permitted the matter accumulated in the abscess to be discharged into the bladder, and to pass out by the urethra, as we have already related. The *biscayen*, detached from its osseous adhesion, must necessarily have followed the course of the liquid, and be carried by its

own weight towards the opening in the bladder, where it was, in some sort suspended for some years; a portion of its surface constituting for the time a part of the walls of this viscus. This part must have been continually moistened by the urine, as it was no doubt situated at the bottom of the body of the bladder.

The other portion of the *biscayen* was retained and suspended by the membranous and fibrous cyst; which nature had early formed about it, and which did not give way, even when the weight of the foreign body was considerably increased by the incrustation, which covered a considerable part of its surface. At length a violent exertion of the patient having separated the edges of the opening of the bladder, the ball fell into the cavity of this organ; where its presence was immediately perceived, by the distressing sense of weight and severe pains which such a body as an iron ball, covered with calculous asperities, would unavoidably produce. There was no merit then in recognising its existence; the indication was obvious, but the execution more difficult; the difficulty however was one which was easily overcome by an experienced surgeon, familiar with anatomy. Both these qualities are united in M. Souberbielle. When the patient was sounded by the other sur-

geons, the first recognised the presence of the foreign body, because he had for an instant turned the beak of the sound towards the pubis (perhaps without being conscious of it) where the *biscayen* projected. But in the subsequent examinations, the instrument being introduced into the bladder, only the upper part of the *bas-fond* was explored. The finger introduced into the rectum could not distinguish the foreign body. It is, therefore, by no means surprising that it was not discovered until it had fallen into the bladder.—Besides we think it fortunate for the patient that the operation was not attempted before the entrance of the *biscayen* into the bladder, and the cicatrisation of the opening through which it had passed. Because, by operating sooner, the patient would have been exposed to some serious accidents.

With respect to Remy, the subject of the second case, it appears evident to me, that, at first, the ball had pursued a course similar to that of the *biscayen* in Dapret, and had pierced one of the walls of the bladder, without falling into its cavity. After receiving for some time calculous laminæ from the urine, nature, in closing the opening into the bladder by cicatrisation, had expelled the ball which had gradually made its way upwards and forwards, towards the *linea alba*, to



the spot from which it was extracted. It is probable also, that the lesion of the bladder was made at that part of its wall contiguous to the portion of the pubis, where the ball was stopped, as in the *biscayen*. That the successive retraction of the bladder separated it, and that, after being detached, it readily passed through the cellular membrane towards the *linea alba*. The cure of the lesion of the intestine is also remarkable, as well as the extraction of the projectile.

If we add to these cases the effects of sanguineous extravasations into the bladder, in consequence of the injury of vessels which communicate with the urinary passages, we shall have completed, I think, the history of all the organic lesions of this viscus arising from wounds.

It sometimes happens, especially in young subjects, that the arterial blood is poured directly into the bladder or one of the tubes which terminate in this membranous sack, forming, notwithstanding the continual flow of the urine, a coagulum so thick that its presence may either produce the symptoms common to calculi, or a state of general disease, throwing the patient into a sort of ataxia. But how, it may be inquired, can the blood coagulate while remaining in the bladder with the urine? Without pretending to re-

solve this question, we think that this coagulation may take place; *First*. Because all arterial hæmorrhages are accompanied with a suppression of urine, to a certain extent; as well from the diminution of the fluid necessary for this secretion, as from the direct or sympathetic inflammation of the kidneys. *Secondly*. Because when the blood has arrived suddenly, in large quantity, in the bladder, it displaces, by its specific gravity, the urine from the *bas-fond* of this viscus; where it will coagulate, in proportion as the subject is in a state of febrile heat, or as the blood may be more plastic, as is observed in young persons of robust constitutions.

The coagulum, being once formed, resists the dissolving power of urine, and acquires consistence by the earthy matter which is deposited upon its surface; in this case it may become a foreign body as pernicious as a calculus. The operation of lithotomy is equally indicated for the extraction of the coagulum, after we have ascertained that its density and consistence is such that aqueous injections into the bladder, such as may be made with the machine of M. J. Cloquet, cannot dissolve it. It is, generally, easy to distinguish a coagulum from a true calculus; at any rate, I did this in the case of a man who had been

wounded by a sword in the right kidney, in whom there was a considerable extravasation of blood into the bladder. Notwithstanding the evacuation of blood through the urethra, a large coagulum was formed, of such a consistence as to cause the patient great anguish, and to induce a state of nervous spasms that, continued until death, which took place at the end of forty days after the wound.

On examining the body after death, besides a wound in the right kidney, made by the point of the sword, with lesion of one of the principal branches of the emulgent artery, a hard, black coagulum was found in the bladder. Having seen this man in consultation a few days before his death, and being satisfied that there was a large quantity of coagulated blood in the bladder, I proposed the operation of lithotomy for the purpose of evacuating this organ, and to dissipate the general spasm with which the patient was affected, which no doubt contributed to keep up the internal hæmorrhage and adynamia. But the proposition was rejected. It is very probable that the operation, if practised at a proper period, might have been attended with satisfactory results. Besides, no serious injury could have arisen from it.—I think then that the operation of

lithotomy for extracting coagulated blood, hardened in the bladder, may with propriety be performed in some cases.

“Many surgeons may not be prepared to admit the explanation which has been given by M. Larrey, of the suspension of the ball in the bladder by a part of its sphere, and, of consequence, the incrustation of that portion bathed by the urine.\* But, whatever explanation may be given of these two cases, related by M. Larrey, there can be no doubt that they are worthy of being inscribed in the annals of medical science. Two circumstances appear to me remarkable in these cases. *First.* We have never seen, as far as I know, foreign bodies become incrustated when they have been lodged in other parts than those cavities having mucous surfaces, for example, the bladder, digestive passages, uterus, &c. *Second.* On the other hand, large calculi have been known to pass out from the bladder by the hypogastrium, in consequence of an abscess. This last fact, recorded by Doctor G. Caumont, was also seen by Doctors Lalaurie, Segalat, &c. &c. the following is a summary of the case.”

\* The following remarks are added by one of the members of the Society, in whose transactions the latter part of this essay appeared.

“A man, twenty years of age, who had suffered for five years of *ardor urinæ*, was sounded by a surgeon, who discovered a hard body in the bladder. Sometime afterwards, the man was again sounded, and no calculus could then be found. A suitable regimen was prescribed, and the man returned to his usual avocations. But the symptoms increased rapidly; a tumour manifested itself in the hypogastrium, and terminated in suppuration. On the third day, the patient felt in the ulcer a painful sense of weight, and when a probe was introduced, it touched a hard body, which the surgeon discovered to be a calculus, and extracted it. This stone was of an oval form, with a smooth surface, and weighed about nine drams. A large quantity of pus and urine followed its extraction, and continued to be discharged by the ulcer, the edges of which became hardened. But this yielded to the use of a catheter, kept in the urethra and bladder. The ulcer of the hypogastrium cicatrised, immediately after which the patient was seized with dysuria, which terminated with the discharge of a small stone from the urethra.

“In his report upon this interesting case, M. Deschamps explains the discharge of the stone by the hypogastrium by saying, ‘It is probable

that it was at first lodged in a particular cyst of the bladder, having a partial communication with the interior of the viscus. That from the violent efforts of the patient, required by his profession, this cyst became inflamed, and a local inflammation having been communicated to the neighbouring parts, by degrees extended even to the integuments, and in the centre of this mass of inflamed parts, an abscess was formed.' 'Thus,' adds this learned reporter, 'the extraction of the calculus was permitted. The same thing occurred which has sometimes happened in calculi of the kidneys, and *vesicula fellis*, &c.'"



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